

# Cyber Halo Innovation Research Program (CHIRP) Handbook

CHIRP Program Document 2026

May 2026

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Prepared for  
the U.S. Department of Energy  
under Contract DE-AC05-76RL01830

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Richland, Washington 99354

## Summary

The Cyber Halo Innovation Research Program (CHIRP) handbook outlines a comprehensive framework designed to advance space cybersecurity education, workforce development, recruitment efforts for United States Space Force (USSF) Space Systems Command (SSC) and the Department of the Airforce, and foster students' professional growth. It provides an overview of CHIRP's objectives and strategic focus, establishing the foundation for participant engagement through a network of collaborations with academic institutions, contracted industry partners, training and certification organizations, federal agencies, and community organizations. It states a clear participation strategy for SSC and Pacific Northwest National Laboratory (PNNL) for program execution and successful support for student transition to a career in space cybersecurity.

The handbook outlines the student participation framework with attention to engagement strategies, recruitment processes, and program experiences, highlighting support mechanisms and obligations to ensure continued growth of student career aspirations. This includes contractual obligations students are responsible for after CHIRP graduation.

For program execution and risk management, the handbook addresses challenges in talent acquisition and retention along with funding constraints, evolving threats to the space mission, and participant engagement strategies. These aspects are designed to ensure an adaptive response to possible concerns of program execution.

Key performance indicators underscore the program's success and sustainability, these focus on collaboration effectiveness, relevance and impact, satisfaction, delivery, and overall experience. Insights gathered from program execution surveys are designed to provide feedback on participant experiences and satisfaction. These captured KPI's will provide information that is instrumental for continued improvement, growth of the program, and its objectives.

## Acknowledgement

PNNL would like to extend its deepest gratitude to SSC S6 for their unwavering and continuing support of the CHIRP program. Their invaluable commitment and dedication have played a pivotal role in the success of CHIRP students, empowering them to achieve and surpass their academic and professional goals. Through collaborating with SSC S6, the CHIRP team have been able to provide innovative resources and opportunities that have significantly enriched the educational experiences of our participants. The partnership and shared vision for excellence between PNNL and SSC S6 exemplify the transformative impact of collaborative efforts in paving the way for future leaders. Without their steadfast support, the accomplishments witnessed among CHIRP students would not have been possible.

CHIRP leadership is grateful to PNNL leadership for their growing support, guidance, and commitment, which have been crucial to the success of CHIRP. The unwavering direction provided by the National Security Directorate and Workforce Development Directorate has been instrumental in achieving our goals. We acknowledge and appreciate their exceptional dedication, without which CHIRP would not have reached its current level of success. CHIRP leadership wants to thank them for their involvement and empowering the program to excel and setting a foundation for our continuing achievements.

CHIRP leadership extends our gratitude to the academic partners and faculty advisors for their continued support of the CHIRP students. Their dedication in providing guidance, research facilities, and a nurturing environment has been invaluable as students balance the demands of both school, life, and work. Their commitment to ensuring the students' wellbeing has played a crucial role in the many successes that the students have been able to accomplish. Without their support and encouragement, the CHIRP students would not have been able to achieve the remarkable accomplishments they have today.

## Acronyms and Abbreviations

AWS	Amazon Web Services
AI	Artificial Intelligence
ATO	Authority to Operate
CSUDH	California State University Dominguez Hills
CSUSB	California State University San Bernardino
CMD-IT	Center for Minorities and People with Disabilities in Information Security
CHIRP	Cyber Halo Innovation Research Program
DoD	Department of Defense
DoD-UC2	Department of Defense University Consortium for Cybersecurity
DOE	Department of Energy
FY	Fiscal Year
GMiS	Great Minds in STEM
IEEE	Institute of Electrical and Electronics Engineers
KPI	Key Performance Indicator
MOU	Memorandum of Understanding
NSA	National Security Agency
PNNL	Pacific Northwest National Laboratory
RF	Radio Frequency
RFI	Request for Information
RFP	Request for Proposal
ROI	Return on Investment
SULI	Science Undergraduate Laboratory Internship
STEM	Science, Technology, Engineering, Mathematics
SSC	Space Systems Command
SOW	Statement of Work
USSF	United States Space Force
US	United States
UTEP	University of Texas El Paso
WiCyS	Women in Cybersecurity

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## 1.0 Introduction and Background

### 1.1 Purpose

The CHIRP Handbook is an administrative document to be used by CHIRP leadership, PNNL, SSC, academic partners, and other contracted industry partners who are responsible for the implementation and execution of CHIRP. This document is intended to serve as a general reference and guideline for the program. It is not a definitive rulebook and does not constitute fixed policies or regulations. As CHIRP evolves, this document may be updated, revised, or modified to better address emerging needs or changing circumstances every new fiscal year. The flexibility to adapt is essential to ensure the continued effectiveness and relevance of CHIRP. Users are encouraged to regularly review the most current version to stay informed of any updates or changes.

This document ensures consistency, provides a clear reference point, enhances accountability, and supports onboarding, and communication across the leadership teams and participants. It ensures continuity during transitions and creates a foundation for scaling and future growth.

### 1.2 Background

CHIRP aligns with 2022 National Defense Strategy, USSF Talent Development & Space Priorities Framework and the National Security Strategy by developing a talent pool of highly qualified professionals after graduation. CHIRP is a two-year undergraduate program tailored for students pursuing 4-year degrees in computer science, cybersecurity, and engineering. It integrates theoretical foundations with hands-on applications, fostering immediate career readiness in the space cybersecurity sector. The program is actively establishing key partnerships with additional academic institutions, federal agencies, and contracted industry leaders, that will provide students with access to cutting-edge technologies, professional mentorship, and opportunities to engage in groundbreaking space and national security research. CHIRP provides a specialized avenue for Space Systems Command to recruit, train, and hire graduates from the program that are mission ready. The program is instrumental in providing additional capabilities for students to work on hands-on research. This pathway provides students with opportunities for full-time positions at SSC designated specifically to them, as well as meaningful training, mentoring, and career development opportunities. This is intended to provide SSC with another resource in attracting talent and the capability to fulfill current and future cybersecurity needs.

CHIRP started as an initial proposal in Fiscal Year (FY)19 aimed at finding cybersecurity talent and pushing innovation in cybersecurity and technology research in collaboration with SSC and academic partners. CHIRP is designed to foster collaboration between PNNL, SSC, academia, contracted industry partners, and other government agencies. In FY21, CHIRP received official funding via Congressional Add, initiating the program's first recruitment efforts at its first academic partner. This included a series of crucial tasks, beginning with the drafting and signing of a Memorandum of Understanding (MOU) among SSC, PNNL, and the first academic partner. This MOU established the intent for all parties to collaborate effectively on CHIRP implementation and alignment. The MOU included details regarding intellectual property rights, statements of work, program implementation strategies, funding mechanisms, dispute resolution pathways, collaboration guidelines, and security clearance processes. To promote the program and recruit students, the development of CHIRP marketing materials was undertaken, highlighting the program's objectives, opportunities, and ways to collaborate as industry partner, academic partner, and mentor.

A focused effort was made by the teams from SSC and PNNL to establish a process for identifying key cybersecurity subject areas that would serve as the basis for research and development projects. This initial set of challenges was drawn from SSC S6 mission priorities and ongoing projects at SSC, facilitated by PNNL. The academic partner took on the responsibility of identifying a classified and unclassified workspace to accommodate the program's needs, along with determining necessary hardware, software, and staffing requirements capitalizing on their status as a National Security Agency (NSA) Center of Excellence.

Essential to the program's development was the student selection criteria developed by the CHIRP leadership team, accompanied by the creation of a cyber bootcamp aimed at identifying top student talent and the first cohort for the program. The CHIRP leadership team and SSC also took steps to form a review board tasked with the selection of the students and identifying the initial space cybersecurity research topic.

A thorough exploration into potential additional internship pathways was conducted. The goal was to identify opportunities that could complement the program and enhance the experience and capabilities of participating students. Various internship options were evaluated to determine their alignment with the program's objectives and the strategic needs of SSC. Despite the promising opportunities these internships presented, the examination revealed that they did not closely align with the immediate needs and priorities of SSC. The internships lacked synergy with the mission priorities and the specialized research and development goals of CHIRP. It was concluded that incorporating these internship pathways would not provide the desired support for the program's long-term objectives. The decision was made to focus exclusively on avenues that directly fulfill the requirements and aspirations of SSC, ensuring a more tailored and effective approach to advancing the program's objectives.

The next section will present an overview of CHIRP, detailing its structure and functionality, covering the program's objectives, and operational framework.

### **1.3 Program Objectives and Focus**

CHIRP is designed to support students as they advance through the program and train them to become highly skilled in space cybersecurity, ready to address modern threats to space-based technologies. CHIRP's core objectives include:

- Developing resilience in space cybersecurity through targeted education and hands-on research.
- Integrating real-world applications like certifications and workshops to prepare students for space domain careers.
- Establishing mentorship programs and collaborations with SSC and contracted industry partners to drive innovative research.

The visual representations below outline the current objectives and focus of CHIRP. The first graphic captures the programs commitment to developing a skilled workforce through targeted education, forming strategic partnerships, optimizing recruitment, and advancing research innovation. The second graphic highlights key areas of focus, such as enhancing workforce resilience, improving national security and space mission posture, fostering collaboration, and elevating educational standards, providing a clear view of how each element contributes to addressing space-based cybersecurity skills shortage.

CHIRP's current objective focuses on cultivating a skilled workforce through targeted education and hands-on training, aligning student research with emerging space cybersecurity challenges,

and strengthening national security by preparing students for a career in safeguarding critical space assets from cyber threats.

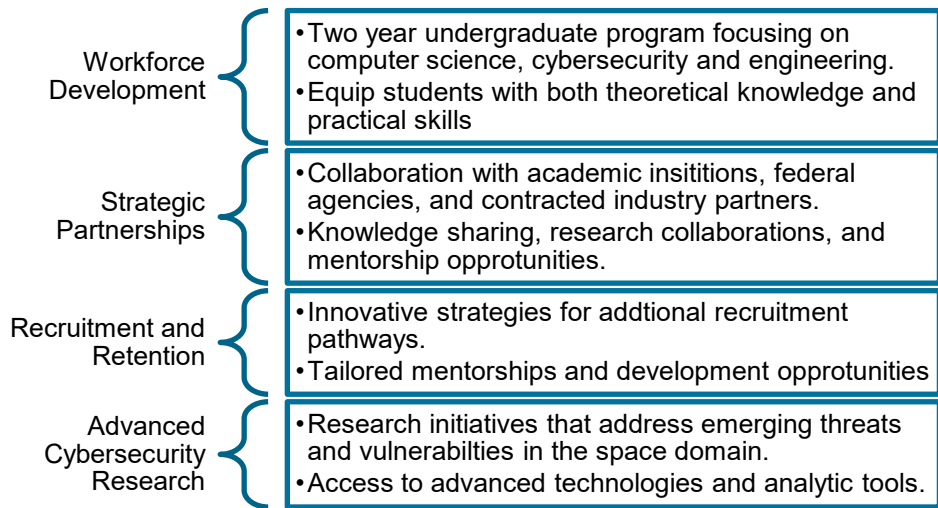


Figure 1 CHIRP Objectives

CHIRP's additional focus is centered on enhancing workforce resilience, advancing space mission capabilities, fostering collaboration among participants, and improving the national security posture against evolving space cybersecurity threats. Through targeted training, professional development, and partnership-driven initiatives, CHIRP ensures that students are equipped to address the dynamic challenges of space cybersecurity.

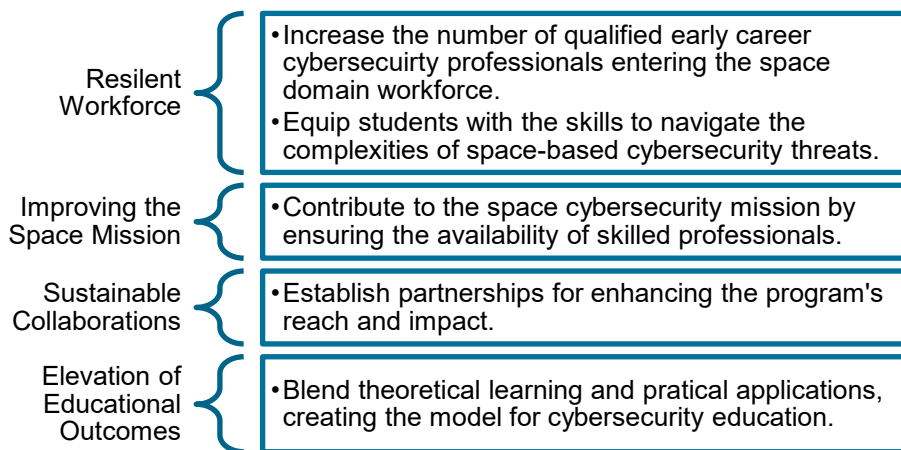


Figure 2 CHIRP Focus

Building these objectives and focused strategies, CHIRP continues to drive innovation, foster collaboration, and elevate educational standards to address critical challenges in space cybersecurity.

### 1.4 Current Participant Strategy

The success of CHIRP relies on the collective efforts of its dedicated participants (e.g. academic institutions, federal agencies, contracted industry partners, students, etc.) herein referred to as participants. CHIRP's current strategy aims to maximize engagement, ensuring that

participation objectives for the program are met, and enhance the overall experience for everyone involved. Each participant takes part in the collective activities of CHIRP to achieve workforce development goals through active support, expertise, resources, contributions, and engagement.

## 1.5 Participant Objectives

The program is developing additional participant engagement strategies to communicate its contributions and benefits. This is crucial for fostering relationships with the participants and attracting additional support by demonstrating the program's continued relevance to the space cybersecurity domain. Engagement strategies will focus on pipelines with specific goals within mentoring, internship collaboration, and post CHIRP placement opportunities with dedicated efforts aligned to each pipeline

The program ensures that participants feel like they are part of a team that is working towards a common goal. The program leadership team conducts monthly check-ins with academic, federal, and contracted industry partners, and weekly check-ins with students to ensure success and reiterate the importance of their active participation in the program. The participants are aware of their time commitment and how important it is for on-going interactions with each other. The single most important part of the program is the commitment of the management team to ensure that all participants have the resources they need to stay informed, empower their successes, enhance their appreciation for the program objectives, while actively encouraging collaborations. A yearly briefing will be created to provide updates and context for SSC leadership, PNNL team members, and additional recruited students.

Participants are encouraged to provide feedback to the program management team on changes to program design and implementation strategies. This strategic feedback loop ensures that program goals, activities, and educational materials align with the student's successful completion of the program. This strategy promotes program trust and increases participant ownership and commitment to the program.

Program staff and management coordinate all activities, aligning objectives, managing partnerships, and overseeing educational outcomes, with interests centered on implementing initiatives, achieving strategic goals, and maintaining high programmatic standards.

Additional details are provided in [Appendix A](#)

## 1.6 Partnerships

### 1.6.1 Academic Partners

Academic partners are essential to CHIRP, providing expert faculty, advanced facilities, and coursework guidance to align students' studies with program objectives and future cybersecurity roles. They deliver relevant degree programs (e.g., computer science, cybersecurity, engineering), help recruit and enroll qualified students, foster a supportive learning environment, and report student progress to CHIRP to ensure graduates are prepared to meet program and employment commitments.

CHIRP leadership works with SSC to connect academic partners to research capabilities, state-of-the-art technologies, and collaboration networks that advance space cybersecurity solutions. Partner institutions are strategically located near Space Force Bases, enabling direct interaction with Space Guardians and real-world exposure to space defense applications. The 2025 program design may evolve with DoD policy changes to keep research aligned with SSC's cybersecurity needs and emerging technologies.

### 1.6.2 Contracted Industry Partners

Contracted industry partners provide technologies, expertise, and internships that support CHIRP's development and give students hands-on, real-world research experience in space cybersecurity. They serve as mentors, offer access to current industry technologies, and provide summer internships that help students understand the professional landscape, make informed career choices, and strengthen their research.

### 1.6.3 Community Engagement Organizations

CHIRP is actively engaging with community engagement organizations to facilitate outreach initiatives that will allow students to demonstrate and present on their space cybersecurity research. These engagements foster a sense of responsibility and connect students with broader community challenges, making their work relevant and impactful. This engagement also provides avenues for the larger cybersecurity community to be aware of the program, its commitments to student success, and growth and additional engagement opportunities.

### 1.6.4 Training and Certification Program Partners

Training and certification program partners collectively extend CHIRP's technical depth, professional rigor, and workforce impact by providing structured, standards-based pathways for skill development and validation. Through accredited, hands-on training, students engage in progressively challenging labs, simulations, and scenario-based exercises that target core cybersecurity competencies (e.g., network defense, secure systems engineering, incident response) alongside space-domain specific skills such as satellite communications security, ground segment hardening, and mission assurance under cyber-contested conditions. These offerings are tiered by experience level and mapped to CHIRP learning outcomes, allowing students to build from foundational concepts to advanced, mission-relevant problem solving while developing the teamwork, communication, and socio-technical awareness required in the space industry. In parallel, certification program partners enable students to earn industry-recognized cybersecurity credentials that align with CHIRP's curriculum and the needs of the space and defense sectors. Exam objectives are cross walked with course content and training labs, ensuring that preparation activities simultaneously reinforce CHIRP competencies and certification readiness. Existing collaborations have already contributed to the design and deployment of new early-career cybersecurity certifications that validate baseline skills for space-focused roles and can be offered not only to CHIRP students but also to Guardians and other personnel, expanding the certified cyber talent pool across the broader space enterprise. Together, these training and certification partnerships complement CHIRP's internal programs, support targeted recruitment into specialized tracks, and provide measurable, portable credentials that signal readiness for advanced technical and operational responsibilities.

## 1.7 PNNL and SSC Roles and Responsibilities

**PNNL** is responsible for determining the CHIRP model, identifying requirements for the program (i.e., type of talent, location of talent, access to talent, etc.), establishing MOUs with identified academic partners, identifying classified workspace, developing CRADA's with contracted industry partners, and itemizing additional requirements that will support the continued operation of CHIRP.

PNNL has critical oversight to ensure that CHIRP students and additional participants are supplied with the tools to successfully execute and complete program objectives. PNNL supports the transition of students into competitive positions within SSC and provides guidance in identifying additional pathways for hiring. PNNL may establish a cap on the number of

participants in the program with the intent to ensure positions are available for employment. PNNL is dedicated to supporting the implementation and use of CHIRP across SSC and other identified partners.

PNNL provides avenues for potential students and collaborators to interact with program leadership, SSC, and other researchers to get a deeper understanding of the program specifics, including ongoing support. The leadership team actively conducts informational sessions and presentations throughout the academic year to provide information on the program's objectives and the potential roles the students would take on during their time in the program.

**SSC** is responsible for establishing the terms of student commitment for educational support, including contract execution. SSC is working on facilitating full-time employment opportunities and connecting with approved partners to enable students to meet service obligations. SSC ensures that deferral requests from student obligations for advanced degrees are reviewed and a decision is made to ensure the continuing education of participating students. SSC is also responsible for ensuring financial accountability by supervising the reimbursement of educational costs by participants who fail to meet obligations, potentially coordinating debt collection to the United States (US) Treasury.

## **2.0 Student Participation**

### **2.1 Student Objective**

The program sets clear objectives for its students, emphasizing skill development and professional growth. Key activities include certification training to enhance skills, conference participation for networking and exposure to advancements, and community outreach to foster social responsibility. Students also participate in competition-style activities for practical, hands-on training that is essential for skill development.

The program primarily targets students pursuing degrees in cybersecurity, computer science, and engineering. These students are selected for their commitment to academic success and improving their future, which drives their contributions to the program's mission. The program focuses on developing students who strive for personal and professional excellence, equipping them to achieve their goals and make impactful contributions to their communities.

Each student that participates in the program receives specialized training in the field of space cybersecurity and is assigned a seasoned mentor for the duration of their commitment. They are required to work with their mentors on novel applications and research in the cybersecurity field and present their research after completion. Students that successfully complete CHIRP requirements are committed to civil service for 2 years or the equivalent to paid time within the program. This pathway can include job opportunities with other federal agencies and contracted industry partners.

The upcoming section will detail CHIRP's strategies focused on students. It will outline methods to keep students actively involved in the program through various interactive initiatives. This includes describing tactics for attracting students and highlighting targeted efforts and partnerships with academic institutions. Lastly, it will cover how new students are integrated into the program, including orientation sessions and essential resources to support their transition.

#### **2.1.1 Student Recruitment and Outreach**

The program is actively attracting qualified students by increasing awareness through partnerships with educational institutions, community organizations, and professional networks. This is being accomplished through targeted outreach efforts, including hosting informational sessions, participating in career fairs, and fostering relationships with academic advisors and contracted industry partners.

#### **2.1.2 Student Selection Process**

The program reviews student applications to ensure their academics and drive to succeed aligns with program requirements and objectives. Applications are evaluated based on academic performance, experience, and personal statements that reflect interest in the program and its mission and if aligned, the candidates are invited to participate in an interview. Recommendations or references are considered to verify candidates' capabilities and character. Final selections are made by SSC using a standardized metric scoring system method to ensure fairness and consistency. All students that enter the program should be U.S. citizens and eligible to obtain their security clearance.

#### **2.1.3 Student Onboarding**

Once selected, the students participate in a summer institute activity that gets them familiarized with program culture, research activities, and program expectations. The summer institute is in place to guide students through their developmental phases, enhancing their research skills

through training sessions. The integration into research teams is carried out seamlessly, allowing students to contribute meaningfully while receiving valuable feedback. The summer institute is utilized to gauge student eagerness for the program and provide an avenue for students to consider dropping out of the program before it officially begins.

### 2.1.4 Student Engagement Strategy

Students engage in a variety of activities to improve their experience in the program, learning outcomes, and professional development activities. The Workforce Development lead provides an enriching experience by fostering critical thinking and collaboration among peers for career development, and personalized program learning outcomes. Program Mentors provide clear guidance on program objectives including professional development activities, additional learning platforms, professionalism training, and educational support. The mentors actively engage with the students by creating a positive and supportive learning environment and the students feel welcomed, valued, and respected during their program journey.

Program management ensures that program objectives, expectations, and logistics are clearly defined and communicated. Through the identification of the research interest of the space industry, program management can address the varying interests and potential areas of research for students to focus on. Open communication is key to ensure that students are aware of program research objectives for successful completion before CHIRP graduation. By understanding the significant impact that the students will make in space cybersecurity research, the program manager can ensure the allocation of adequate support and attention needed for each student. This strategy has contributed to the overall efficiency and success of the program. By enabling an open communication policy, program management can ensure meaningful progress, address any challenges or risks, and make any necessary adjustments to program objectives to align with student research outcomes.

### 2.1.5 Student Program Experience

Program leadership continually engages students and tracks their progress with their research, mentors, and academics throughout their time with CHIRP. This engagement ensures that the students can overcome any challenge. Program leadership encourages student participation in conferences, workshops, and seminars as common practice to broaden student knowledge and understanding of the space cybersecurity research field. Program management conduct evaluations throughout student participation in the program to continually assess the student's growth, research applicability, and program effectiveness.

### 2.1.6 Student Compensation and Benefits

The program implements a wide-ranging support system that includes competitive salaries, coverage of other related expenses, mentorship support, avenues for professional development, and leadership opportunities. This support mechanism is actively ensuring that the students are equipped to thrive and contribute effectively to the space cybersecurity research objective.

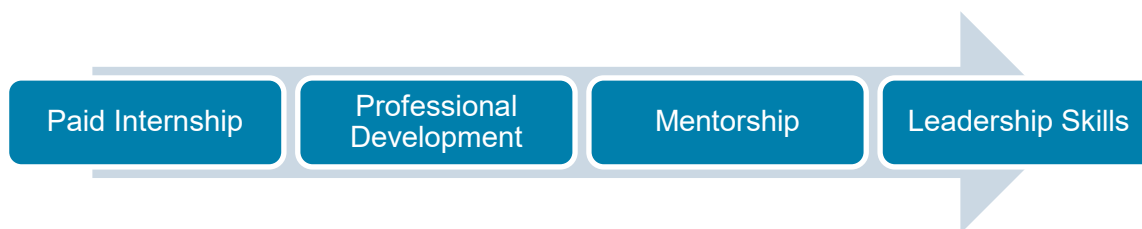


Figure 3 Student Compensation and Benefits

Students receive **competitive salaries** that compensate them for their research contributions while attending university. The students work up to 20 hours a week during their time in the program, with additional requests taken into consideration if additional hours are needed (e.g., travel, certifications, training, etc.). They are not required to work during finals week, so they can focus on their academics. Life can sometimes happen, and the students can request leave during this time to ensure their health, and their well-being is taken care of. This is to ensure that the students have the financial stability to be successful but also ensure that they have a good work-life balance.

**Professional development** is a major focal point, with students participating in workshops, seminars, and conferences that enhance their knowledge and professional growth. These opportunities are promoting continuous learning and exposing them to the latest innovations and trends in their research field. The students work with their mentors to identify professional development opportunities that will enhance or complement their current research and outreach efforts.

A **mentorship** system is in place, with experienced researchers, contracted industry partners, and SSC assigned to guide students throughout their program journey. This mentorship helps students navigate challenges, refine skills, and develop a deeper understanding of their research domain and professional aspirations for their future. The students are assigned technical mentors to provide them guidance on their research and the importance of collaboration in teams. The students are also assigned a life coach mentor that guides them through career development, problem solving, communications, and professionalism.

**Leadership skills** building opportunities are incorporated into the program, encouraging students to take ownership of their research projects. This is fostering the development of their leadership skills by providing an environment where they can collaborate with peers and lead small teams.

This support system ensures students are well-compensated, equipped, and nurtured for their professional journeys. By integrating multiple layers of support, the program stands as a unique platform for advancing both the academic and practical aspects of research directly benefiting the students and contributing positively to the ongoing SSC cybersecurity research objectives.

### **2.1.7 Student Performance Expectations**

The expectations and guidelines for student participation within the program emphasize the importance of professionalism, accountability, and personal growth. The outlined standards serve as a foundation for students to develop essential skills and behaviors that align with the program's mission while fostering a productive and collaborative learning environment. By adhering to these principles, students are enabled to contribute meaningfully to program objectives while honing their abilities in areas such as communication, teamwork, adaptability, and ethical conduct. Each aspect of the program standards is designed to support both individual and collective success, ensuring every student is prepared to excel in their responsibilities and future endeavors.

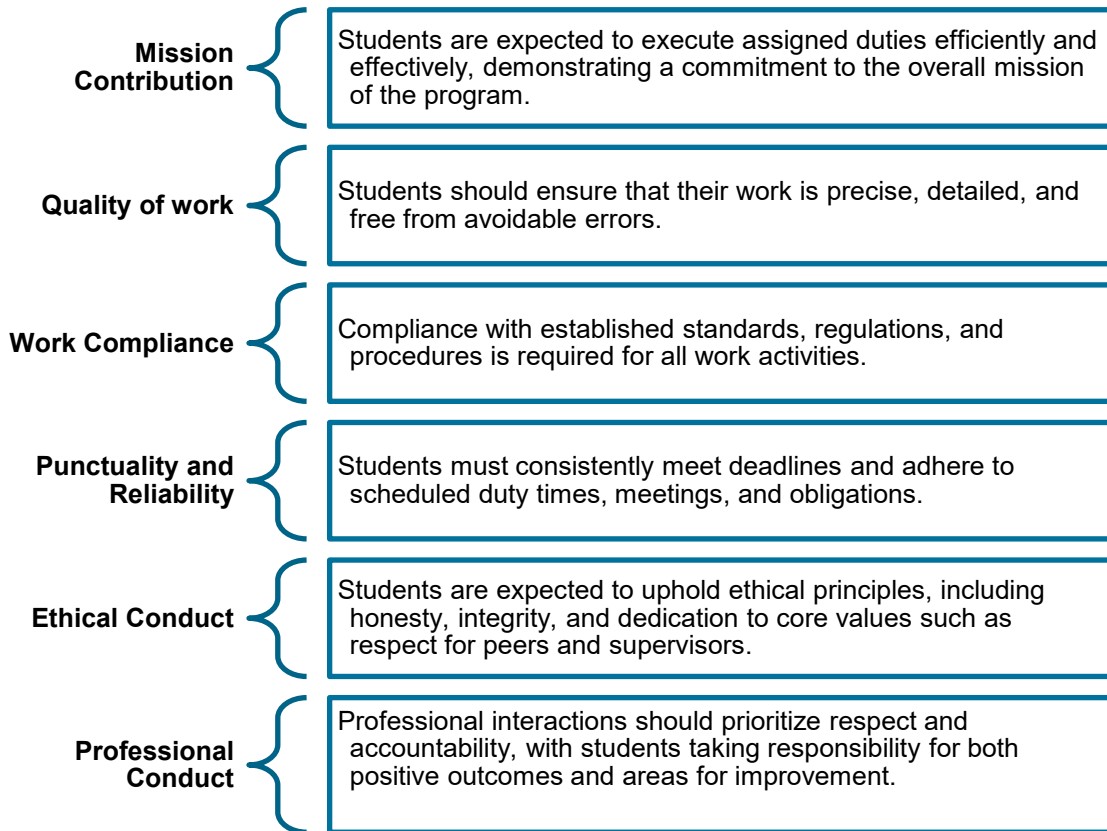


Figure 4 Contract Requirements

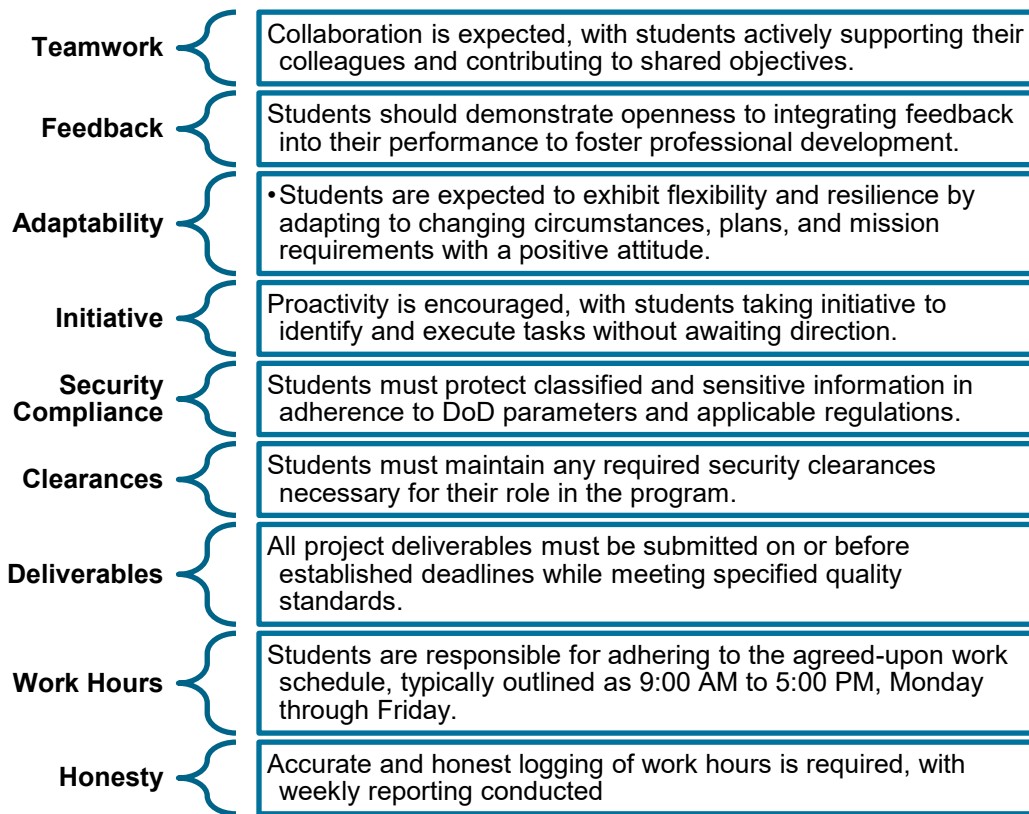


Figure 5 Contract Requirements

Requests for hours or purchases related to personal development should directly support skill-building and knowledge enhancement relevant to CHIRP. As personal development resources and time allocations are limited, all requests must align with the program’s objectives and focus on activities or tools that directly advance professional development in cybersecurity and innovation. Interns are required to provide all available information about their requests, including detailed descriptions of the resources, purpose, and relevant context, along with clear justification explaining how the request supports their learning or performance goals within the program.

General requests must be communicated clearly, concisely, and respectfully, with sufficient context to ensure efficient decision-making. Interns are expected to follow established program protocols for submitting requests, seeking resources, or requesting assistance. To demonstrate professionalism and problem-solving skills, interns should propose solutions alongside problems whenever applicable. Efforts should also include seeking clarification when necessary to avoid misunderstandings or missteps. These requirements are designed to ensure productive and professional experience within CHIRP while maintaining alignment with its mission of advancing excellence and innovation in cybersecurity research.

Additional documentation on student expectations was developed and shared with the students. An example of the signed expectations document can be found in [Appendix B](#).

### 2.1.8 Student Commitment

The program requires a commitment phase for students after graduation. Students are expected to sign a contract within their first month within the program, obligating them to a two-year service period post-graduation. This commitment acknowledges the support students received during their time within the program. Students are given the flexibility to defer this commitment

should they choose to pursue further education through graduate or Ph.D. programs. Throughout this phase, they are encouraged to confirm and accept roles that align with the program's objectives, ensuring that their transition from academic to professional careers is seamless and that their contributions significantly impact the space industry.

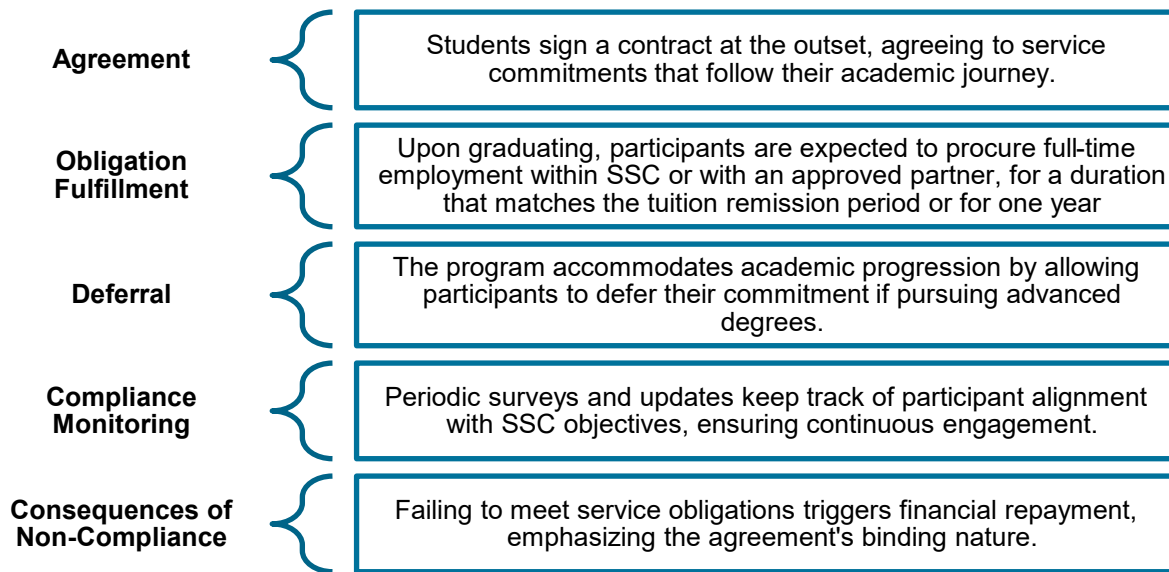


Figure 6 Student Obligation

### 2.1.9 Student Career Appointments

CHIRP graduates are uniquely positioned to join SSC, USSF, and contracted industry partners, safeguarding space-based assets against cyber threats. CHIRP enables students to increase their social and professional skills during their time in the program. The students demonstrate that they are highly motivated, hard-working, and very ambitious. This experience is intended to train and qualify the CHIRP students for positions in the space cybersecurity industry.

**USSF and SSC:** Upon student graduation, USSF and SSC can provide civilian workforce billets for students to start their commitment phase of the program. These billets are crucial for students to exercise their expertise and continued support to USSF and SSC. These billets are vital to USSF and SSC to execute space cybersecurity missions and provide the students with the opportunity to support current Space Guardians. This is an on-going challenge and is actively being addressed.

**Contracted Industry Partners:** Contracted industry partners learn firsthand the commitment of the student's ambition for success with the completion of a designated internship during their second year in the program. The partners are encouraged to provide additional avenues for hiring the students in addition to opportunities to collaborate with USSF or SSC on future endeavors. This is an on-going challenge and is actively being addressed.

**Other Government Agencies:** Graduates hired by other government agencies can contribute significantly to safeguarding national interests and fostering an environment of secure technological development. Once the partnering agency has been identified, the students can transition to their new positions that will fulfil their commitment obligations. This is an on-going challenge and is actively being addressed.

Filling positions in these key areas is currently imperative to enhancing space cybersecurity, and as the program continues to evolve, hiring graduates will become easier with additional contributions to student success.

### **2.1.10 Student Offboarding**

The CHIRP leadership team offers dedicated support to students as they transition out of the program and into their full-time roles. This includes guidance in preparing their final research reports, which detail methodologies, results, research findings, and the appropriate control and transfer of tools they developed during their internship. Students ensure that all documentation, code, and relevant research materials are transferred to a shared team drive accessible to CHIRP leadership for further review or development. Students are instructed to back up and save personal copies of work that have undergone derivative classification review and information release as appropriate, allowing them to use these materials for publications or hiring portfolios. This process also helps them compile a professional portfolio that highlights their contributions to SSC, such as presentations, research summaries, and publications.

As part of the offboarding process, students engage in an exit interview with their student liaison to provide valuable feedback on their experience and discuss ways to maintain ongoing support after graduation. The leadership team formally recognizes the students' accomplishments by providing a certificate of completion, attending their graduation or a graduation recognition event, and celebrating their achievements. Beyond the program, CHIRP leadership maintains strong ties with students, regularly checking in to ensure they are thriving in their new positions. Students may be called upon to present their experiences in the program to new recruits, serving as ambassadors for CHIRP. Students provide periodic updates on their professional work, fostering continued collaboration and connection with the leadership team, who remain available to offer guidance and support even after the students have transitioned to full-time roles.

CHIRP Return on Investment (ROI) outcomes can be reviewed on [Appendix C](#). This section details the research, outreach, and activities that the Cohorts completed during their enrollment in the program.

## **3.0 CHIRP Execution Leads Current Roles**

The success of the CHIRP program relies on a clearly defined leadership and support structure that ensures strategic alignment, effective operations, and a high-quality student experience. Key roles, from program leadership to workforce development, student liaison functions, and mentoring, collectively guide CHIRP's direction, execution, and impact. Each position contributes to advancing SSC's mission and strengthening the emerging space cybersecurity workforce by providing governance, coordination, professional development, and technical guidance. Additional details can be found in [Appendix D](#).

### **3.1 Program Director**

The CHIRP Program Director makes informed strategic decisions to ensure the CHIRP focus and objectives are implemented effectively. These decisions encompass the approval of additional initiatives, resource allocation, priority adjustments, risk management, and collaboration terms. This position ensures that all program activities are aligned with SSC overarching mission and objectives. The Director is supported by coordinated efforts with SSC and with dedicated program staff and leads, ensuring that the necessary resources for program execution meet program responsibilities effectively.

### **3.2 Deputy Director**

The CHIRP Deputy Program Director assists the CHIRP Program Director in executing strategic initiatives and ensures efficient operation and alignment with CHIRP's focus and objectives. They support the facilitation of resource allocation, monitoring CHIRP priorities, assessing potential risks, implementing CHIRP structure plans, engaging with external entities, and supervising CHIRP team training and support. The Deputy Director is integral to maintaining CHIRP momentum and responsiveness, acting under the guidance and authority of the CHIRP Program Director.

### **3.3 Workforce Development**

The Workforce Development Lead focuses on enhancing the skills and knowledge of students to meet the demands of SSC and the space cybersecurity mission. They assess the needs of the students (e.g., training, education, support, etc.) by developing opportunities for advancement in their CHIRP journey. They are responsible for evaluating the effectiveness of student interactions and making suggestions for program adjustments to align with the needs of the student experience. They manage the Student Liaison's and mentor's activities to ensure that they have the support they need to provide meaningful and impactful guidance to the students.

### **3.4 Student Liaison**

The Student Liaison acts as the communication bridge between the students and CHIRP leadership. They focus on managing and enhancing the experience and involvement of students through research projects and professional development by concentrating on the individual development and integration of students into CHIRP. They are responsible for coordinating professional development activities by providing information on resources for students to explore opportunities. They coordinate research project timelines, deliverables, and communications between students.

## **3.5 CHIRP Mentors**

The mentors are PNNL employees and may include SSC and contracted industry partners and serve as workforce coaches and trusted colleagues, and not supervisors. The program's mentoring process includes the identification of professional development activities and guidance and utilizing the mentor's knowledge and expertise to shape the next generation of space cybersecurity professionals. The mentors are assigned to students within the first month after the summer institute and are subject to change based on student and mentor satisfaction and availability.

### **3.5.1 Professional Development Mentor**

The professional development mentor guides and supports the students throughout their time in the program. They provide advice, share experiences, and help the students develop professional skills they need to be successful in their career. This role ensures that students are given support, guidance, encouragement, and insights into their career progressions to help them stay on track. Through student engagement, the mentor will help the students recognize their strengths and address areas of improvement, empowering them to take on new challenges with confidence. They offer a safe space for students to discuss challenges, celebrate their successes, and receive emotional support during their program journey.

### **3.5.2 Technical Mentor**

The CHIRP Technical Mentor guides and supports students in their technical skill development and helps them improve their technical expertise. The mentor shares their knowledge with the students so they can learn new technologies and refine their problem-solving skills. They provide career advice, offer insights into SSC and civilian careers, and choose the right technology for their research. They assist in identifying valuable resources, tools, and learning materials that can further support the students' technological growth and development.

## 4.0 CHIRP Risk Management

### 4.1 Risk Management Plan

To ensure the successful execution of CHIRP and its initiatives, a comprehensive risk management plan is essential. The purpose of the risk management plan for CHIRP is to identify, assess, and mitigate potential risks that may arise. This is crucial to ensure the well-being of the participants; CHIRP program leads and minimizes the impact of any identified risks to the program.

This plan identifies potential risks, assesses their impact, and outlines mitigation strategies to safeguard program objectives. By implementing these strategies, the program can ensure that the main goals are not only met but exceeded, thereby delivering value and maintaining integrity across all activities. As potential risks evolve or are identified, these are subject to change and should be updated periodically to ensure alignment with the program's successful execution.

#### 4.1.1 Talent Acquisition and Retention Challenges

Attracting and retaining skilled cybersecurity talent is essential for CHIRP's success in addressing the space industry's workforce needs, yet challenges in recruitment, retention, and onboarding pose significant risks to the program's ability to achieve its objectives.

Table 1 Talent Acquisition and Retention Challenges

Risk	Potential Impact
Difficulty in recruiting students for the program can create gaps in talent, impacting the program's ability to meet space cybersecurity objectives.	Unfilled cybersecurity roles may hinder the program's ability to address immediate threats to national space mission assets.
Inefficient recruitment strategies can delay the hiring process, reducing the readiness of the workforce for critical space cybersecurity positions.	Talent shortages can compromise the program's ability to support SSC cybersecurity initiatives, potentially leaving the space mission vulnerable.
Prolonged hiring processes can impede the program's ability to deliver talent when required, affecting the program's responsiveness to space cybersecurity needs.	Slow recruiting practices can disrupt workforce development timelines, affecting SSC's readiness to counter emerging cyber threats and weakening the cybersecurity posture of space missions.
Failing to retain experienced candidates can result in a significant loss of knowledge crucial to advancing space cybersecurity capabilities.	The inability to attract and retain the best candidates limits innovation and research advancements critical to the program's success.

#### Mitigation:

- CHIRP leverages academic partner partnerships, outreach programs near Space Force bases, and non-traditional recruitment efforts to attract skilled candidates.

- The program streamlines recruitment processes with digital tools and interim clearance programs to accelerate hiring timelines.
- CHIRP establishes internship-to-hiring pipelines and fast-track initiatives to minimize delays and maintain workforce readiness.
- The program implements mentorship opportunities and knowledge management systems to preserve and transfer critical expertise effectively.
- Students are provided hands-on training with emerging technologies and certifications tailored to SSC needs, ensuring they are ready to fill vital roles.
- CHIRP offers competitive salaries, tuition assistance, leadership opportunities, and professional development initiatives to retain top talent.

#### 4.1.2 Funding and Resource Constraints

Securing adequate funding and resources is crucial for CHIRP to maintain its scope, quality, and operational efficiency, as limitations in financial support, tools, and expertise threaten the program’s ability to scale effectively and meet the growing demands of the space cybersecurity mission.

Table 2 Funding and Resource Constraints

Risk	Potential Impact
Without adequate financial support, CHIRP may struggle to maintain its scope, quality, and operational efficiency.	A reduction in funding would force CHIRP to scale back its initiatives, affecting recruitment efforts and the delivery of high-quality research.
The absence of essential tools, technologies, and skilled personnel limits the program's ability to deliver effective outcomes.	Insufficient resources impair students’ preparedness for the workforce, diminishing their ability to address cybersecurity challenges in space missions.
Restricted funding may prevent CHIRP from expanding to meet the growing cybersecurity needs of the space industry.	Lack of ongoing funding jeopardizes the program’s sustainability and its ability to adapt to the ever-evolving space cybersecurity landscape.
Limited resources can hinder research advancements, reduce mentorship opportunities, and weaken professional development efforts for students.	Resource limitations could misalign student research and program activities with SSC cybersecurity needs, weakening national security efforts.

#### Mitigation:

- Engage participants and advocate for legislative recognition of CHIRP as a vital initiative to secure consistent, long-term funding.
- Establish partnerships with contracted industry partners for cost-sharing agreements to provide advanced tools, technologies, and expert mentorship.

- Develop scalability strategies through expanded collaborations with academic partners, contracted industry partners, and federal agencies to align with increasing space cybersecurity demands.
- Implement targeted resource allocation to prioritize critical areas like student mentorship, hands-on training, and cutting-edge cybersecurity research to maximize impact.

### 4.1.3 Evolving Cyber Threat Landscape

As cybersecurity threats continue to evolve, CHIRP faces the challenge of staying ahead of emerging trends and aligning its research and training objectives with the dynamic needs of the space industry to ensure its participants remain prepared to tackle mission-critical vulnerabilities.

Table 3 Evolving Cyber Threat Landscape

Risk	Potential Impact
As cybersecurity threats rapidly evolve, there is a risk that student-led research may become outdated or fail to reflect the latest trends in space cybersecurity.	Obsolete research and misalignment with SSC needs weaken CHIRP's ability to produce meaningful contributions to space cybersecurity innovation.
Student research projects may not align with SSC priorities, reducing the program's ability to contribute to mission-specific cybersecurity advancements.	Unaddressed gaps in student research may lead to unknown vulnerabilities in critical SSC projects and potentially compromising national security.
Failure to adapt research objectives to new threats could lead to vulnerabilities in mission-critical space projects, exposing national space infrastructure to cyber risks.	Inadequate exposure to emerging threats results in students lacking the skills necessary to tackle real-world challenges, delaying workforce effectiveness.
Without exposure to up-to-date tools, technologies, and threat landscapes, students may graduate ill-prepared to handle advanced cybersecurity issues required for SSC roles.	If CHIRP fails to adapt research and training to evolving threats, its reputation as a cutting-edge workforce development program may diminish, potentially affecting recruitment and funding.

#### Mitigation:

- Continuously update research objectives in collaboration with SSC and contracted industry partner experts to align with the latest developments and cybersecurity trends.
- Facilitate regular mentorship by SSC and contracted industry professionals to guide student research projects and confirm alignment with space mission priorities.
- Implement rigorous review processes where research is periodically evaluated by SSC to identify and address potential risks early on.
- Integrate training in emerging technologies, such as Artificial Intelligence (AI), quantum computing, and evolving cybersecurity frameworks, into the program's research, ensuring students are ready.

- Attend and present at workshops and conferences focused on cutting-edge space cybersecurity advancements to ensure CHIRP remains at the forefront of innovation and education.

#### 4.1.4 Participant Engagement

Effective participant engagement is essential for CHIRP’s success, requiring strong collaboration, alignment of interests, and active involvement from students, SSC, contracted industry partners, and academic partners to achieve program objectives and maximize its impact on space cybersecurity.

Table 4 Participant Engagement

Risk	Potential Impact
Differing goals and priorities among students, SSC, contracted industry partners, and academic partners can lead to inconsistent cybersecurity objectives within the program.	Misaligned interests can fragment the space mission’s cybersecurity goals, reduce program efficacy and limit student outcomes in gaining essential skills.
Lack of clear communication between participants may hinder coordination, negatively affecting research outcomes and program efficiency.	Communication breakdowns and conflicting priorities can disrupt execution timelines, impact SSC mission readiness and weaken program contributions.
Conflicting priorities between SSC mission needs, industry objectives, and academic goals may cause delays in implementing critical cybersecurity strategies.	Lack of effective collaboration may lead to gaps in cybersecurity research deliverables, potentially leaving vulnerabilities unaddressed within space mission projects.
Failure to establish strong partnerships and collaborative mechanisms can reduce the program’s ability to execute cybersecurity research aligned with space mission requirements.	Students may miss out on critical mentorship and industry insights due to low engagement, leaving them underprepared for cybersecurity roles in the space domain.
Insufficient engagement from participants may limit the depth of collaboration, mentorship, and research contributions, impacting educational outcomes and workforce readiness.	Poor participant alignment can undermine partnerships with SSC, academic partners, and industry, reducing program relevance and support over time

**Mitigation:**

- Establish clear and consistent communication pathways between students, SSC, contracted industry partners, and academic partners to align priorities and program objectives.

- Implement regular weekly check-ins with students and SSC, monthly meetings with academic partners and contracted industry partners, to promote transparent communication and ensure seamless coordination among all participants.
- Conduct frequent alignment workshops and feedback sessions to address varying priorities and refine strategies to meet SSC mission needs, industry goals, and academic objectives.
- Foster joint research initiatives and mentorship programs that actively involve SSC professionals, contracted industry partners, and academic partner faculty to strengthen partnerships and enhance collaboration.
- Increase participant engagement by demonstrating the value of contributions, offering personalized support, and integrating interactive activities like brainstorming sessions focused on space cybersecurity challenges.

#### 4.1.5 Program Delivery and Implementation

Successful program delivery and implementation are vital for CHIRP to achieve its mission of developing a skilled cybersecurity workforce and addressing critical space cybersecurity challenges, but several risks threaten its efficient execution and alignment with strategic objectives.

Table 5 Program Delivery and Implementation

Risk	Potential Impact
Fragmented objectives between SSC, academic partners, contracted industry partners, and students may lead to inconsistency in delivering and implementing program goals.	Misalignment among participants can cause inconsistent implementation of CHIRP objectives, weakening the program’s ability to address high-priority cybersecurity needs for the space mission.
Uncoordinated priorities between participants can result in delays or inadequacies in achieving CHIRP’s cybersecurity and workforce development objectives.	Differing priorities or ineffective collaboration can disrupt operational timelines, ultimately affecting readiness for SSC mission preparedness.
Failure to implement mission-aligned cybersecurity training strategies could hinder student development and compromise the program’s ability to meet workforce demands.	Failure to execute strategies efficiently may leave students without the critical cybersecurity competencies needed for direct entry into the space cybersecurity workforce.
Inadequate allocation of resources, whether financial or technological, may reduce program efficiency and compromise the quality of student training and research.	Resource shortages or ineffective program execution can compromise the scalability, quality, and impact of CHIRP initiatives, reducing its contribution to the space industry.

**Mitigation:**

- Facilitate collaborative planning sessions with SSC, academic partners, students, and contracted industry partners to unify goals and ensure consistent implementation of program objectives.
- Organize frequent alignment meetings to identify discrepancies in priorities and adjust strategies to ensure synchronization with SSC mission needs and demands.
- Refine delivery methods to incorporate feedback loops and continuous assessments, ensuring cybersecurity training strategies are effectively aligned with program goals.
- Optimize resource allocation by leveraging cost-sharing agreements with contracted industry partners to address additional financial and technological needs.

## **4.2 Key Performance Indicators (KPI's)**

The risk management monitoring will involve collecting and analyzing participant satisfaction, CHIRP execution alignment with SSC objectives, identifying and mitigating new risks, and making necessary adjustments for continued improvement. KPIs will be developed to track the program's resilience in managing identified risks, participant satisfaction, and growth adjustments for successful program execution. The CHIRP KPI's will include:

### **4.2.1 Program Effectiveness**

Program participants will be surveyed to evaluate the program's effectiveness in delivering valuable experiences. This feedback process will measure how well the program supports professional development, enhanced learning objectives, and the preparation of students for the space cybersecurity mission. Satisfaction scores will provide insights into different program aspects, such as student growth, partner collaboration, and readiness for space industry careers.

### **4.2.2 Program Execution**

The evaluation of program execution will focus on specific components like research relevance, resource adequacy, and partnership quality. Feedback from participants will assess whether the program meets professional growth needs, aligns with industry standards, and facilitates valuable collaboration. High satisfaction levels will confirm the program's capability to deliver a coherent and impactful workforce development experience.

### **4.2.3 Program Research Progress**

Surveying and measuring the progress of research objectives is central to assessing the program's effectiveness in fostering innovation within the space cybersecurity domain. This will involve tracking the initiation of impactful research projects, evaluating the quality and significance of research deliverables, and monitoring the integration of research findings into actionable strategies.

### **4.2.4 Graduate Success**

The hiring rate of CHIRP graduates is a crucial metric, indicating how effectively the program prepared its students for employment in the space industry. This rate will reflect the program's ability to train students with relevant cybersecurity and research skills. Feedback, from both industry collaborators and SSC, will provide additional insight into satisfaction with cooperative efforts and shared resources. This feedback will provide insight into the program's success in

building strong partnerships and aligning with industry expectations, ultimately supporting graduates' transition into their careers.

In addition to KPI development, CHIRP will implement a performance monitoring and evaluation framework to ensure the achievement of its objectives and the continuous improvement of its initiatives. This framework is fundamental to assess progress, make informed decisions, and enhance the program's operational effectiveness and impact on the space cybersecurity mission.

#### 4.2.4.1 Talent Acquisition and Retention

Recruiting and retaining top-tier cybersecurity talent is critical to CHIRP's mission of building a skilled workforce capable of addressing cyber threats to space technology. By focusing on metrics such as recruitment success, retention rates, and graduate placement, the program evaluates its ability to attract highly skilled applicants, support their educational journeys, and ensure they transition into key cybersecurity roles upon completion.

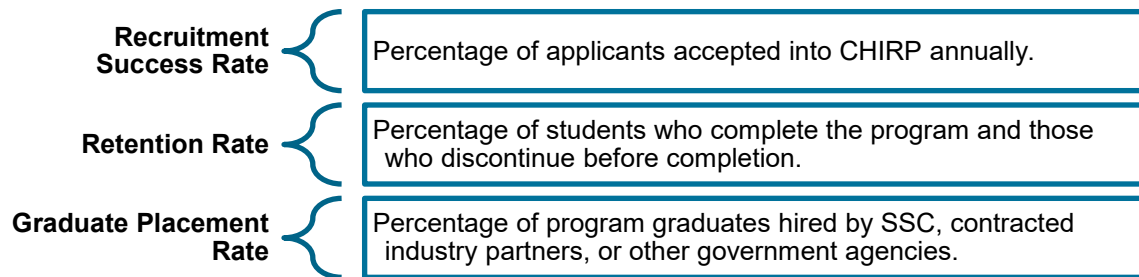


Figure 7 Talent Acquisition and Retention

#### 4.2.4.2 Collaboration and Effectiveness

Collaborative engagement is foundational to CHIRP, bringing together all participants to achieve shared goals. By monitoring participation rates, feedback quality, and contributions from all contributors, CHIRP assesses the strength of its collaborative efforts and ensures meaningful interactions that advance space cybersecurity innovation.

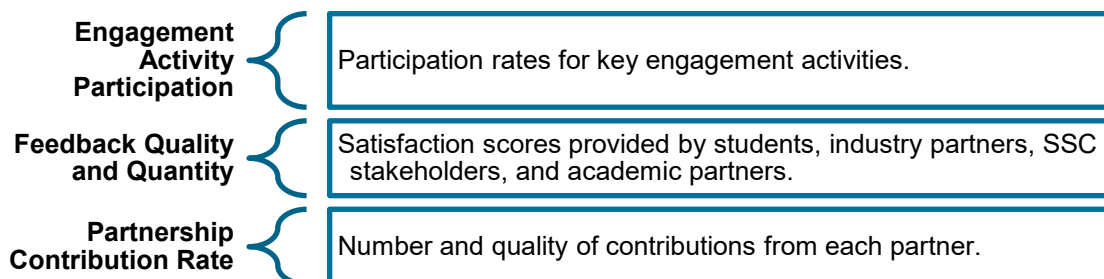


Figure 8 Collaboration and Effectiveness

#### 4.2.4.3 Research Relevance and Impact

Impactful research is at the heart of CHIRP, with students undertaking projects that address real-world space cybersecurity challenges while aligning with SSC priorities. Metrics such as alignment audits, deliverable evaluations, and publication rates help ensure that student research contributes to practical solutions and drives innovation in the space industry.

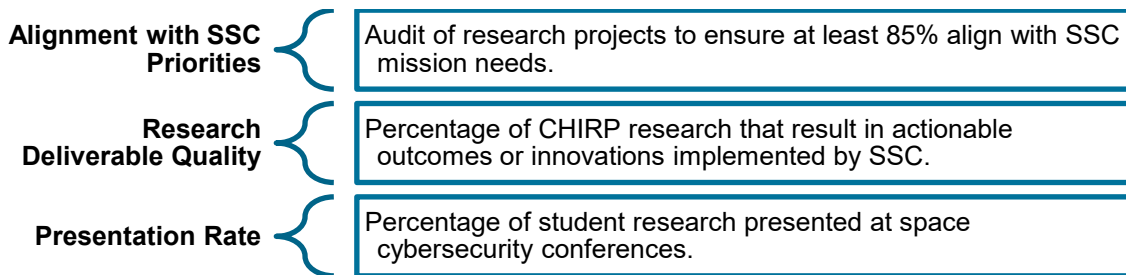


Figure 9 Relevance and Impact

#### 4.2.4.4 Participant Satisfaction

Satisfaction among all program participants, whether students, mentors, academic partners, or industry stakeholders is key to CHIRP’s success. Through consistent feedback collection and monitoring of mentorship effectiveness and engagement levels, the program ensures that participants feel supported, valued, and invested in achieving the program’s goals.

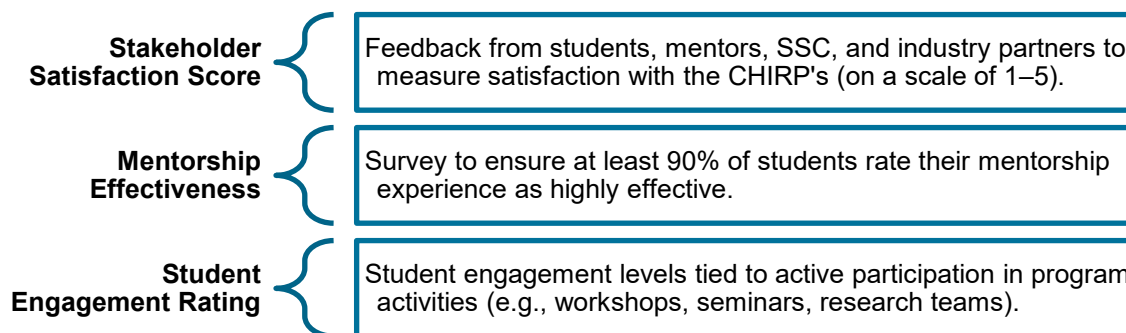


Figure 10 Satisfaction

#### 4.2.4.5 Program Delivery

Efficient program delivery is vital for CHIRP’s ability to achieve its objectives and maintain operational excellence. By tracking on-time milestone delivery, resource utilization, and participant success, the program ensures that each component is executed effectively and contributes to the development of skilled professionals for the space industry.

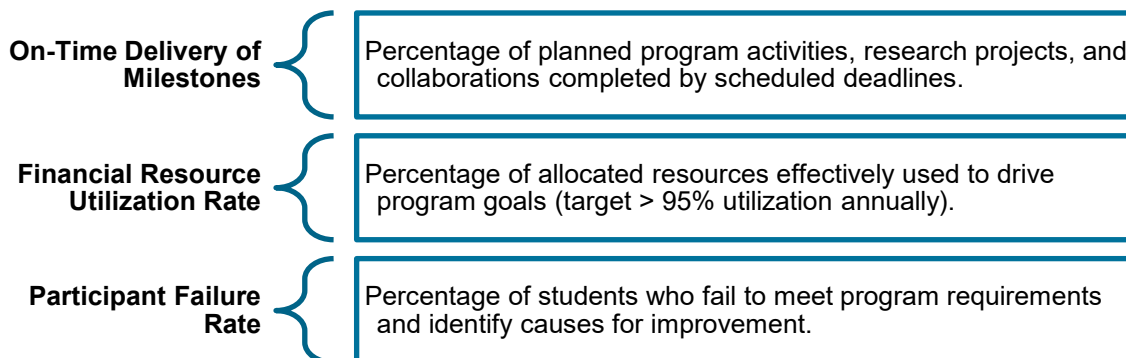


Figure 11 Delivery

#### 4.2.4.6 Quality of Practical Experience

Hands-on practical experience is an integral part of CHIRP’s framework, providing students with the opportunity to apply their learning to real-world challenges. Metrics like training completion,

technology engagement, and graduate readiness help ensure that participants leave the program equipped to excel in space cybersecurity careers.

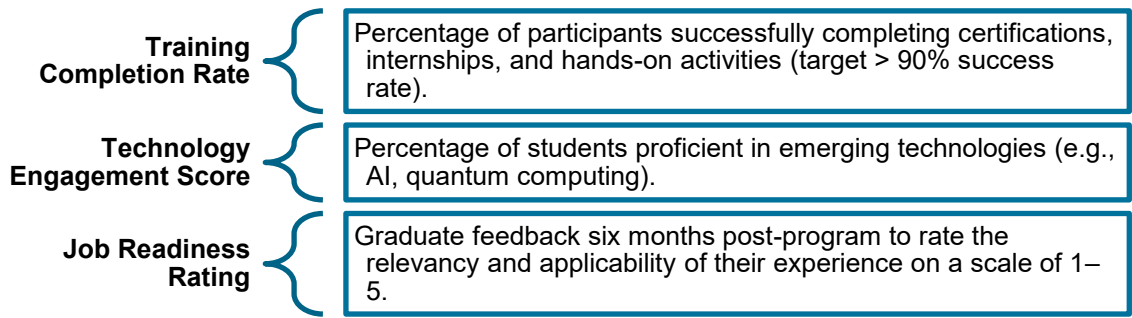


Figure 12 Experience

KPI's and performance monitoring serve as a foundational tool for evaluating CHIRP's success in achieving its mission of workforce development, research innovation, and strategic alignment with SSC priorities. By monitoring participant satisfaction, graduate hiring rates, and research progress, these KPIs provide valuable insights into the program's effectiveness and impact on space cybersecurity. The continuous assessment and refinement guided by these indicators ensure that CHIRP remains adaptive to emerging challenges while maintaining its commitment to excellence and long-term sustainability in securing the future of space-based technologies. The KPI's provide CHIRP with the necessary tools to continually assess program effectiveness, ensure alignment with strategic objectives, and adapt to dynamic challenges within space cybersecurity. By integrating targeted performance metrics, actionable feedback mechanisms, and comprehensive monitoring systems, the framework enables the program to identify areas for improvement, advance its goals, and maintain its commitment to producing a skilled workforce and impactful research outcomes. This continuous evaluation and refinement ensure that CHIRP remains at the forefront of innovation, collaboration, and operational excellence in the national security and space mission domains.

The program expanded challenges can be found in [Appendix E](#).

## 5.0 Continued CHIRP Growth and Impact

The program is committed to integrating sustainability measures to ensure the continuity of Student support for success, program objectives, research advancements, and evolving educational outcomes. This will ensure that students acquire the skills and credentials needed to meet the demands of becoming a Guardian. To achieve this, the program will develop strategies for continuous improvement and regular content updates. Continuous improvement provides the students with the most relevant knowledge and skills. This strategy will include additional meetings with industry to discuss how to coordinate and complement student engagement activities through their research and training objectives.

**Academic partner Involvement:** It is important to note that academic partners are the cornerstone of the program's success, as their continued support and active engagement are essential for empowering students and advancing the program's goals. To ensure sustainability, the program will prioritize fostering strong relationships with additional academic institutions by offering mutual benefits, such as access to cutting-edge resources, collaborative research opportunities, and professional development for faculty and students alike. Efforts will also focus on building a robust alumni network, enabling former students to contribute to the program's growth through knowledge-sharing and advocacy. By encouraging collaborative efforts and leveraging the expertise of academic partners, the program ensures its lasting positive impact on education and space cybersecurity research.

**Student Research:** Effective program sustainability includes student research awareness, continued education strategies, and ownership building to ensure that students gain the foundational knowledge to be successful while participating in the program. Making research concepts tangible through practical hands-on experiences will deepen the students' understanding and appreciation for space cybersecurity research. Their confidence in the topic area will be translated to new technological advances that inform how cyber security defenses are developed, how research will drive innovation and defense within the space industry. Students that take charge of their research are likely to invest their time and effort into making the research successful. Student leadership in the program empowers students and provides a sense of accomplishment and responsibility. This sense of ownership will create more passionate and dedicated professionals for the space industry. For the students to benefit from this approach, it is important for them to have a collaborative atmosphere to meet and have meaningful discussions during their research journey. Collaboration opportunities with other students, faculty, mentors, and industry will benefit their research outcomes and build confidence in their growing abilities. The program is committed to providing students with access to state-of-the-art cybersecurity tools, cloud platforms, and simulation environments to foster such a collaborative environment. This is integral to the sustainability to the program's framework, allowing students to bridge the gap between theoretical knowledge and practical application by engaging with cutting-edge technologies. Students enhance their technical expertise and problem-solving skills in real-world contexts. By facilitating experimentation and innovation, the program ensures that students become adept at leveraging advanced technologies, effectively preparing them for the dynamic demands of the space cybersecurity landscape. This access supports the sustainable development of the students' skills and enables workforce readiness.

**Mentorship:** The program's mentorship initiative is another cornerstone of its sustainability. By integrating students with experts, industry leaders, and SSC mentors, this initiative fosters a collaborative environment where real-world space technology challenges are addressed with innovative and effective solutions. This approach not only bolsters the students' education but

also creates a pipeline of skilled professionals who are equipped to tackle the evolving demands of the space cybersecurity field.

Experienced mentors play a critical role in the program by introducing emerging technologies, such as AI and quantum computing, into students' research processes. This forward-looking approach ensures that both students and the program remain adaptable and relevant as the industry advances. The dynamic exchange of ideas and insights between students and mentors drives continuous innovation, allowing the program to maintain its impact and reputation over time.

**Workshops and Seminars:** The program will continue to prioritize student participation in cybersecurity workshops and space industry seminars led by industry and space domain experts. This sustainable activity is crucial for keeping students updated on the latest trends, tools, and techniques in space cybersecurity. By engaging directly with professionals at the forefront of the industry, students will continue to gain valuable insights and access to current knowledge that will enhance their understanding and skills in this rapidly evolving field. These sessions will promote an essential learning environment for students to learn how to apply their research to space cybersecurity and be up to date on technological advancements.

**Participant Engagement:** By actively engaging with industry partners, educational institutions, and community members, who form the foundation of our program's supportive network, this opens opportunities for additional funding that may not have previously been identified. This strategic engagement ensures a diverse and resilient funding base, which is essential for the long-term sustainability and growth of the program. By leveraging the expertise and resources of the program's network, it will continue to enhance the program's offerings and ensure continuous improvement and innovation. This approach not only secures the financial health of the program but also strengthens collaborations, continues to build meaningful partnerships, and provides sustainability for student participation.

Our program's commitment to integrating risk management and sustainability measures ensures consistent execution of the program and the fostering of research advancements that will adapt to evolving educational needs. By implementing the KPI framework and engaging regularly with industry and academic partners, the program will continue to monitor participant satisfaction, align initiatives with strategic objectives, and identify and mitigate emerging risks to program execution.

Through strategic mentorship, cutting-edge resource access, and expert-led workshops, the program has empowered students to tackle real-world challenges with confidence and an innovative spirit. Academic partners continue to provide student resources, guidance, and foster professional identities that strengthen the program's impact. They nurture student leadership and collaboration, creating dedicated professionals in the space cybersecurity domain. The program's continued engagement with the dedicated supportive network has facilitated new funding opportunities that ensure the program's financial and operational resilience.

Together, these initiatives have culminated an educational and workforce development framework designed to produce workforce-ready graduates who are prepared to lead advancements in space cybersecurity. This strategy has ensured the sustainability of the program and its position as a leader of innovation, enabling students to make meaningful contributions to the future of space cybersecurity advancements.

As CHIRP moves forward, it represents a novel approach to the advancement of workforce development innovation and excellence within the space cybersecurity realm. The program's multifaceted approach has encompassed risk management approaches, strategic partnerships, and continuous improvement to deliver exceptional educational and research outcomes.

Through its commitment to nurturing the future workforce, CHIRP aligns with national security priorities and reinforces the defense capabilities of the space mission.

By fostering collaboration, CHIRP has created a productive ground for cutting-edge research and practical applications. The program has integrated resources, mentorship, and real-world training to prepare students for immediate contributions to space cybersecurity efforts. It is this solid foundation that will help propel CHIRP graduates into successful careers, safeguarding space assets against evolving cyber threats.

CHIRP's comprehensive approach to education, through all its facets, from risk assessment to strategic innovation, positions it as a leader in the cybersecurity workforce development domain. By championing strategic partnerships and continually advancing its objectives, CHIRP ensures a legacy of excellence and an expansive impact on national and space cybersecurity initiatives. As CHIRP continues to evolve, it will remain dedicated to empowering its participants, enhancing educational standards, and ultimately shaping the future of cybersecurity within the space mission.

## 6.0 Projected Updated CHIRP Program Model

The three proposed CHIRP models were developed in direct response to needs identified by SSC leadership and our recognition that the current practice required an update. These models are designed to align SSC requirements with students' as they transition into careers in the space industry. While each model differs, one focused on research, one on operations, and one on a hybrid of both, they share common elements of support from mentors, program leadership, and SSC. Unlike current model, these models do not require university support, tuition support, or housing stipends; students are treated as employees and receive a prevailing wage for their work. Across all three models, students engage in technical work within different areas, creating pathways that strengthen their growth, operational readiness, and mission understanding throughout their time in the program.

By the end of month three, SSC and CHIRP leadership will make a formal decision about whether each student will continue in the program. That decision is grounded in criteria that are communicated up front and reinforced during the first three months. Leadership will look at whether the student can clearly explain the SSC problem statement they are working on, use the required standards, tools, and workflows, respond constructively to feedback, and work reliably and effectively within their team. Other considerations include basic professional expectations by showing up consistently, communicating in a timely way, behaving respectfully, and following all security and data-handling requirements. During this time, students receive feedback and at least one clear opportunity to improve, unless there is a serious conduct or security issue that requires immediate action. If, after that period, a student still does not meet the continuation criteria, they are formally released from the program, and their position is backfilled during the next recruitment cycle.

In the following sections, a description of each model is defined, what the model is, how the model works, and how the model structures a student's experience, so SSC leadership can directly compare the model's features, understand the tradeoffs, and determine which approach best aligns with mission needs and workforce goals.

### 6.1 Research Model

The research model immerses students in SSC-aligned problem statements that directly support SSC's mission. Students undertake research questions that SSC identifies, requests, and prioritizes based on current mission needs. This ensures that every effort is both technical and operationally relevant. Building on the successes of the original model, this updated approach is designed to grow students' technical and research talent with an understanding of space cybersecurity in the specific context of SSC's challenges.

This model provides deep technical understanding, strong analytical skills, and sound research discipline, giving students hands-on experience in space cybersecurity research.

Students work with researchers, engineers, and analysts, and under the guidance of technical mentors, students learn how professional research is done in a mission driven context. This includes how to frame clear, defensible technical questions, translate those questions into testable hypotheses or design objectives, and choose appropriate methods, tools, and data to investigate them.

With their mentors, students design and execute experiments, develop and refine prototypes, and run simulations, and lead the interpretation of the results. Through this work, students become familiar with core research practices along with understanding version control, basic project management, and documentation standards such as code comments, and configuration

tracking. The goal is not just to complete tasks, but to teach students how technical work is planned, executed, and evaluated where quality, traceability, and repeatability matter. This is important because SSC must be able to trust that research outcomes are accurate, reproducible, and ready to inform real decisions about systems, capabilities, and risk.

There is a huge emphasis on professional research habits, especially documentation and clear technical communication. Students are expected to produce research artifacts that show both their technical progress and the ability to communicate their work effectively. This may include technical notes, internal research reports, prototypes, and slide-based briefings. Students must be able to explain their objectives, methods, assumptions, limitations, and key findings in ways that can be understood by both technical and non-technical personnel.

Students are expected to communicate consistently and effectively with their mentors and other team members by asking questions, providing updates, and responding to feedback. They learn how to function as part of a professional research team, which includes collaborating across disciplines.

This research model creates a structured, mission-aligned pathway. It ensures that students develop skills that are directly relevant to SSC’s mission, while also learning how to operate in the culture, processes, and expectations of a government research environment. For SSC, this means a better-prepared talent pool that can contribute sooner and with higher quality. For students, it means a more meaningful experience that accelerates their technical growth and makes their work immediately applicable to real-world space cybersecurity challenges.

The table below details the specific research pathway students will perform over the two-year period in the program. It provides information on student research activities including how the research projects are shaped, governed, and how they mature over time. Information includes, initial onboarding and tightly scoped, SSC-defined problem statements, mentor-guided research execution, and the integration of the students work into SSC’s real mission needs. This is the recommended research pathway students follow including what they work on, who guides them, how priorities are set, and how their research outputs transition into real value for SSC and new cohorts.

**Table 6 Research Pathway**

<b>Month 1-3 Onboarding and Foundations</b>	<b>Month 4-6 Core Deepening and Professional Habits</b>	<b>Month 7-12 Transition Period</b>	<b>Month 13-24 Completion</b>
SSC defines, owns, and prioritizes all the problem statements.	Focus on proving the importance of the first set of projects to SSC.	Transition from pilot stage to a real, ongoing research pipeline.	Integrate the student research into SSC’s actual work (if applicable).
Research is only conducted upon SSC approval.	Students work on SSC-defined problem statements with close guidance from Technical Mentors.	SSC expands and organizes its problem statements, matching them to student skill levels and timelines.	Align project timelines with key SSC events for adoption, continuation by SSC, or transition to industry partners.
SSC issues a set of prioritized problem statements that tie directly to mission needs.	Formal reprioritization of SSC’s problem list may occur, leading to	New student cohorts receive mission-first orientation; existing work is handed off if	Bring student tools and processes closer to those used by SSC, emphasizing

	shifts in student tasking.	valuable or stopped if irrelevant.	real-world constraints.
Students are assigned to technical teams and their SSC technical mentor and PNNL mentor.	Regular technical check-ins (weekly or biweekly) to capture changes in threats, systems, or constraints.	Technical Mentor role becomes formalized, responsible for turning SSC needs into research tasks and keeping projects on target.	Map students work to SSC roles and build paths into those roles through internships, assignments, or hiring.
Students produce a concise problem statement report that shares the SSC problem statement and the proposed work to be done.	Students document progress through reports and produce at least one technical document and one briefing by the end of this period.	Standardization of work processes, including code management, documentation, planning, and risk tracking.	Track student outcomes post-program, including SSC or mission-adjacent positions.
Students present an initial research plan approved by their mentors, SSC leadership, and program leadership.		Program tracks impact: usage, decisions informed, and output adoption within SSC.	Build a shared knowledge base and establish hand-off routines to maintain continuity when cohorts leave.

Once a year, SSC leadership and the program team sit down for a structured review to look at what decisions the research supported, where there were gaps, and what new mission areas need more attention, then adjust the next year’s focus and capacity. If it makes sense, the program can expand into additional SSC mission areas or tackle more complex, multiyear problems, if SSC continues to drive the problem set and there are enough mentors to keep things grounded in the mission. Throughout this period, the program keeps a close eye on its own performance, tracking how many SSC problem statements it has addressed, which decisions were supported, how many students have moved into SSC or closely related roles, and how long it typically takes to go from a new SSC problem statement to research results that SSC can use.

## 6.2 Operational Model

The operational model places students directly into SSC-focused work so they are contributing to real mission needs, not just practicing on abstract problems. Instead of tackling open-ended research questions, students work on clearly defined tasks that SSC identifies, validates, and ranks according to current operational priorities. Every assignment is tied to a specific system, threat, capability, or decision SSC cares about, keeping the work grounded in day-to-day space cybersecurity realities.

The primary goal is to grow technically capable contributors who understand how SSC operates. Students build hands-on skills in tools, workflows, and practices that matter in an operational environment, space system security analysis, cyber defense workflows, data handling, and systems integration, while seeing how their output feeds into SSC assessments, planning, and operations. They work side by side with engineers, operators, analysts, and other technical staff, and are coached by Technical Mentors who show them how to turn SSC’s operational challenges into concrete tasks and deliverables. That includes learning how to define clear objectives, break them into executable workflows, select appropriate tools and data, and report results in formats SSC can act on.

Throughout their time in the program, students help build, test, and refine tools, scripts, dashboards, procedures, or configurations that are relevant to SSC’s mission. With their mentors, they design and run analyses, test changes, build prototypes, or execute playbooks and then interpret what those results mean for risk, performance, or mission assurance. During this, they become familiar with core operational practices such as configuration control, version management, and basic project tracking. They also learn documentation habits that matter in a mission environment: clear comments, configuration histories, and test notes. The emphasis is on teaching students how real work is planned, executed, reviewed, and maintained in an environment where quality, traceability, and repeatability are essential, because SSC must trust that outputs are reliable and can be used to support real decisions about systems, defenses, and risk posture.

Professional discipline is a central feature of this model. Students are expected to produce operational artifacts that not only show what they did, but that others can pick up and reuse: technical summaries, code or scripts, test reports, and briefings. They must explain their objectives, approach, assumptions, constraints, and key takeaways in terms that make sense to both technical staff, non-technical staff, and the next cohort. Regular communication with mentors and other students is a requirement, not an option. Students ask questions, provide status updates, capture issues, and respond to feedback in a timely and professional way. They learn how to function as part of a mission-focused team, often working across multiple disciplines.

This operational model creates a structured, SSC aligned pathway. It develops skills that are directly relevant to SSC operations while familiarizing students with the culture, processes, and expectations of a government mission environment. SSC benefits by shaping and evaluating a pool of incoming talent that understands its needs and can contribute quickly. Students benefit by getting a coherent, purposeful experience where their work is clearly tied to real-world space cybersecurity challenges.

The table below describes the operational work students will do with SSC over the two-year program. It shows how SSC defines and ranks work items, how students are assigned and guided, and how their work is aligned with SSC’s ongoing operations and mission needs.

**Table 7 Operational Pathway**

<b>Month 1-3 Onboarding and Foundations</b>	<b>Month 4-6 Core Deepening and Professional Habits</b>	<b>Month 7-12 Transition Period</b>	<b>Month 13-24 Completion</b>
SSC defines and ranks all problem sets and work items that students will take on.	SSC conducts at least one formal re-ranking or update of its task/problem list.	SSC broadens and organizes its list of work items, tagging them by mission area, urgency, and complexity so they can be matched to student capabilities and realistic timeframes.	Project schedules are aligned with SSC’s event calendar, technical reviews, acquisition touchpoints, and planning cycles.
The framework, tools, and expectations are put in place so student work lines up with SSC’s operational needs.	Students will pivot to higher-priority items and lower-value efforts will be stopped rather than allowed to continue.	New students join and receive the same mission first orientation and ongoing efforts are handed off.	The tools and workflows students use are adjusted to more closely match SSC’s operational environments.

SSC provides a prioritized set of tasks or problem areas tied directly to mission objectives	Regular technical check-ins between students, mentors, and SSC teams are used to capture changes in systems, threats, or constraints and to confirm that efforts are still aimed at the right targets.	The program standardizes the way people work. Where code and documents are stored. How status is reported. What a basic task or sprint plan looks like. How risks and milestones are tracked.	The program maps student activities to real SSC positions and builds clear paths into internships, temporary assignments, or direct hiring.
Students are placed on technical teams that include both an SSC technical mentor and a PNNL mentor.	Students keep short, focused progress updates that cover what was planned versus completed, early results, risks, and any recommended changes in scope	The program tracks impact including who in SSC used the results, what decisions were made, actions that were supported, and whether the output were adopted, references, or set aside with reasons documented.	Follow up after students leave to see who enters SSC or closely related roles.
The student produces a short planning document describing the SSC task, the intended approach, and a near-term execution plan, which is reviewed and approved by mentors, SSC leads, and program leadership.	Produce at least one technical document and one briefing for SSC personnel and program leadership.		

To prevent loss of knowledge between cohorts, the program maintains a shared knowledge base with summaries of completed efforts, reusable tools and code, and lessons learned, and it runs deliberate hand-off processes so new cohorts continue previous work rather than starting over. Once a year, SSC leadership and the program team hold a structured review to look at which decisions and activities the pipeline supported, where there were shortfalls, and which mission areas need added focus. They then adjust the next year’s priorities and capacity. If appropriate, the program can extend into more SSC mission areas or more complex, multi-year efforts, if SSC continues to steer the work and there is sufficient mentor coverage to keep it mission grounded. Throughout, the program monitors its own performance: how many SSC needs it has addressed, which decisions were supported and how, how many students have transitioned into SSC or mission-adjacent roles, and how long it takes to go from a new SSC requirement to usable results.

### 6.3 Hybrid Research-to-Operations Model

The hybrid model would use a phased hybrid approach to develop students as strong technical researchers and then as operationally capable practitioners. The structure will consist of two integrated phases that have a research focused area for development and transitioning to operational application and professional development. This model will be a continuation of the successes from the first model with adjustments that will complement and empower students, the program team, and SSC, ensuring on-going talent growth.

Students will begin with an intensive research phase in which they build their technical understanding, analytical skills, and research discipline by working on projects requested and prioritized by SSC. During this first phase, they will be embedded with technical teams, contribute to the design and execution of experiments or prototypes, analyze results, and document their findings in a structured way. This early research engagement is intended to give students a deep, hands-on grasp of core concepts and methods in space cybersecurity research and related domains, while also instilling professional habits around rigor, documentation, and clear technical communication.

In the second phase, students will transition to a more operations and professional development (PD) focused phase. They will apply what they learned in the first phase to mission relevant tasks that will provide experience in operational environments. They will also identify certification and professional development experiences with their mentors that align with space cybersecurity and domain relevant requirements.

This phased approach will produce graduates who are both technically experienced and operationally ready. This enables the student to contribute to capability development and mission execution for SSC.

This new model is intentionally designed to be flexible and to adapt to SSC mission needs, individual student requirements, and cost-effectiveness considerations for sustained program growth. Phase I has an initial duration of approximately 3–6 months, with the exact length based on the student's adaptability and demonstrated absorption of knowledge. At the conclusion of this initial phase, CHIRP leadership and SSC will review mentor and faculty performance documentation, along with student self-assessments and surveys, to determine whether the student has successfully completed Phase I requirements. This review will be used to decide whether the student is ready to advance to Phase II of the program. It will also allow CHIRP to determine whether the student remains a strong fit for the program or should be exited to enable additional recruiting efforts to fill that position.

Under this new approach, the program can realize significant cost savings for SSC through a more deliberate progression model and a revised student support mechanism. Tuition and housing support will remain optional and will be provided based on SSC requirements, available budget, and documented student need. These benefits are not guaranteed. If tuition support or housing support are approved, the student will incur a service commitment to SSC for the duration of their time in the program, consistent with the level of support provided.

The table below describes the hybrid approach students will follow, combining SSC-aligned research and operationally focused work. It shows how students start in research-oriented R&D settings, gradually take on more complex SSC-prioritized work, and then shift toward operational relevance and workforce preparation while still completing key research deliverables.

Table 8 Hybrid Research to Operations Pathway

Month 1-3 Onboarding and Foundations	Month 4-6 Core Deepening and Professional Habits	Month 7-12 Transition Period	Month 13-24 Completion
Assign each student to SSC-aligned R&D projects and/or lab settings with Technical Mentors and research staff.	Take on more complex SSC-prioritized research tasks within project teams.	Technical Mentors assess research quality, reliability, problem solving, and responsiveness to feedback.	The program maps student activities to real SSC positions and builds clear paths into internships, temporary assignments, or direct hiring.
Orient students to SSC S6 mission areas, CHIRP’s two-phase model, expectations, and security/data-handling protocols.	Frame defensible technical questions with design and execution of prototypes. Run simulations/analyses and help interpret results.	PD Mentors and Student Liaison assess professional growth, teamwork, communication.	Follow up after students leave to see who enters SSC or closely related roles.
Introduce basic research practices: Framing technical questions, turning questions into hypotheses/design objectives, selecting appropriate tools/methods.	Regular use of version control, project and task tracking, and learning configuration and data management practices.	CHIRP leadership factors in SSC mission priorities and workforce needs.	
Begin hands-on work with simple experiments, prototypes, simulations, or analyses, including initial exposure to version control, project management basics, and documentation standards.	Continue limited internal PD.	Update students’ individual plans to address shifts in time from research to operational tasking and PD. This could also include identifying operational environments or teams, identifying and selecting specific PD activities to include certifications, specialized courses, or a conference. This also provides an opportunity to decide which research tasks must be finished,	

		handed off, or continued at a reduced level.	
Start producing early research artifacts including short technical notes, internal memos, initial code/prototype documentation.	Reinforce professional behaviors that include, clear, routine project updates, adherence to research protocols, and constructive response to feedback.	Complete key research deliverables while starting operationally relevant work (simulations, exercises, test events, tool evaluations, as allowed by access).	
Limited internal professional development includes mission overview seminars, lunch and learn sessions, and introductory career path discussions.	Begin preparing for mid-point review that includes mentors tracking performance, growth, and mission alignment from work performed.	Begin more targeted PD (planning and initial enrollment) aligned with operational needs.	
Establishing expectations for professional behavior including reliable communication with mentors, reproducible documentation, and time management and teamwork.			

By the end of the program, students focus on fully applying their research-based skills in operational mission environments, completing targeted professional development (including selected certifications, courses, and conferences), and demonstrating mature, independent professional behavior suitable for transition into the national security space cybersecurity workforce.

### 6.4 Student Impact

The **research model** provides students a clear, mission-aligned path to becoming strong technical contributors. They work on SSC-relevant projects and are supported by Technical Mentors and project teams, which helps them:

- Build deep technical and analytical skills through hands-on work (experiments, prototypes, analyses, simulations).
- Learn how to turn loosely defined mission challenges into well-framed technical problems.
- Design and run investigations, interpret results, and see how evidence supports or challenges a given approach.

At the same time, they’re building the professional habits that matter in any R&D setting:

- Clear written and verbal communication.
- Consistent, disciplined documentation.
- Openness to feedback and iteration.
- Effective teamwork in a technical environment.

Because this part of the program is focused on technical and research maturity, students have room to focus on building real competence and confidence before they're asked to take on more complex operational responsibilities. By the time they're working more directly with mission operations and sponsor priorities, they're ready to contribute meaningful, evidence-based technical work with very little additional ramp-up.

The **operational** model gives students real exposure to how capabilities and insights get used in SSC's mission environment. As they move into more operations-focused work, they:

- Take on mission-relevant tasks like simulations, exercises, tool evaluations, test events, and analysis that supports real decisions.
- See how space-cyber systems and defensive capabilities are deployed, maintained, and evaluated in practice.
- Build a clearer understanding of operational constraints, timelines, risk tradeoffs, and how different teams coordinate to get things done.

The support they receive shifts more toward operational and career development. Students get:

- Guidance on how to operate within SSC processes and workflows.
- Insight into real roles (for example, cyber analyst or systems security engineer) and what's expected in those positions' day to day.
- Professional development opportunities that are closely tied to mission operations like courses, certifications, workshops, and conferences.

The operational side of the model helps them connect strong technical skills to mission needs, so they focus on the right work, at the right time, for the right mission outcome.

The **hybrid model** pulls both sides together into a clear, end-to-end development pipeline. From the start, students know they will:

- Have a strong foundation through research-driven work, learning how to think and operate as technical problem-solvers.
- Ability to increasingly apply that foundation to operationally relevant tasks where timing, context, and mission impact really matter.

A structured midpoint review sits between these two major stages. Students are told up front that this review will:

- Assess performance, fit, and readiness against clear standards.
- Provide documented feedback and an individualized development plan.
- Shape how their responsibilities and opportunities grow as they take on more operational work.

If a student is not performing or is not a good fit, they may not move forward and can be exited from the program. For those who are engaged and performing well, the review sharpens expectations, clarifies next steps, and highlights growth opportunities.

Taken together, the hybrid research-to-operations model creates a coherent, demanding, and mission-relevant experience. Students gain:

- Deeper technical preparation from the research component.
- Practical understanding of mission execution from the operations component.
- Structured professional development, clear performance expectations, and transparent progression.

## 6.5 SSC Impact

The **research model** gives SSC depth and foresight. When students are primarily doing R&D, SSC benefits from:

- New analysis, prototypes, and concepts that explore future threats, technologies, and mission challenges.
- Better framing of complex, loosely defined issues into well-structured technical problems SSC can act on later.
- Early experimentation and evidence that can inform future capabilities, CONOPS, and acquisition decisions.

This model tends to have a longer-term, indirect impact on SSC operations. It requires SSC to invest time in defining good research questions and providing technical guidance, but it doesn't demand as much day-to-day operational management. The risk is that some work may remain "interesting but unused" if priorities shift or problems aren't tightly aligned to mission needs. If the students excel in their work, then the research will strengthen SSC's ability to anticipate and shape the future of their mission priorities.

The **operational model** gives SSC immediate, mission focused technical applications. When students are treated more like junior staff and focused on operational tasks, SSC benefits from:

- Extra hands-on mission relevant work: simulations, exercises, tool evaluations, test events, documentation, and analysis that support real decisions.
- Help clearing backlogs or advancing lower priority but necessary tasks, freeing SSC personnel for higher level work.
- Students who understand SSC processes, timelines, and operational constraints can potentially convert quickly into productive hires.

This model has direct, shorter impact on SSC. It demands more day-to-day tasking, oversight, and integration into existing workflows, but the value is tangible and visible. The tradeoff is less exploratory research and innovation, and a risk that students are used mainly for routine work if not carefully managed.

The **hybrid model** combines both and shapes SSC's future workforce while delivering real mission value. SSC benefits from:

- Research that is framed from the start with SSC mission questions in mind, producing prototypes and analyses that are already close to operational needs.

- A growing stream of operationally relevant work as students advance simulations, exercises, tool and capability evaluations, and other mission supported tasks.
- A pipeline of potential hires who are both technically capable and familiar with SSC's mission, tools, constraints, and culture.

The hybrid approach is structured and includes clear expectations, a midpoint review, and planned progression, SSC can:

- Adjust how much each student focuses on research versus operations based on mission priorities and workforce needs.
- Identify high potential candidates early and steer their development toward critical roles.
- Use performance and follow on tracking as a feedback loop to refine the program.

The hybrid research to operations model can provide program students with deeper technical insight from the research they did, to real operational support (from the tasking side), and a more reliable way to grow and select the next generation of SSC professionals.

## Appendix A Engagement Strategies

### A.1 Stakeholder Roles and Responsibilities Future State

The success of CHIRP depends on a tightly integrated partnership between CHIRP leadership, academic institutions, and SSC/Space Force, each playing a distinct yet interconnected role in developing future space cybersecurity professionals. CHIRP leadership serves as the central coordinating hub, aligning academic, research, and student development objectives with SSC's operational needs and priorities. Ideally, academic partners translate those objectives into educational programs, research opportunities, and student support systems that build mission-ready talent. SSC and Space Force provide the real-world mission context, technical problems, and operational guidance that ensure curricula and research remain relevant, timely, and impactful. Together, these roles create a continuous feedback loop that links classroom learning, cutting-edge research, and operational space cybersecurity requirements.

#### **CHIRP Leadership**

- Define academic, research, and student development objectives in coordination with SSC.
- Communicate SSC's cybersecurity needs, emerging technology priorities, and policy changes to academic partners.
- Facilitate access to SSC capabilities, state-of-the-art technologies, and collaboration pathways.
- Receive and review student progress reports, ensuring alignment with program and employment commitments.

#### **Academic Partners**

- Deliver educational programs aligned with CHIRP and space cybersecurity mission objectives.
- Provide research facilities, laboratories, and faculty expertise relevant to space cybersecurity.
- Advise students on academic course selection to support program and career success.
- Assist in recruiting and enrolling eligible students who meet academic and future employment requirements.
- Cultivate a supportive learning environment, including mentoring and additional academic resources.
- Monitor and report student progress to CHIRP leadership each term.
- Collaborate with CHIRP/SSC on research topics that address immediate SSC cybersecurity needs and explore emerging technologies.

#### **SSC and Space Force Stakeholders**

- Provide mission-aligned problem statements, operational context, and technical guidance.

- Engage with academic partners and students through technical briefings, mentorship, and base visits.
- Support the integration of space cybersecurity operational realities into curricula and research.

Measuring the effectiveness of CHIRP's collaborative model requires more than tracking basic program statistics; it demands a structured approach that links each partner's responsibilities to tangible outcomes. By evaluating how well CHIRP leadership, academic partners, and SSC/Space Force perform their defined roles, and how their combined efforts translate into mission-ready talent and impactful research, the program can continuously refine its design and operations. The following measures provide a framework for assessing success across student outcomes, curriculum relevance, research impact, and the strength of the partnership itself.

### **Clarity and alignment of mission objectives**

- Existence of a jointly defined set of academic, research, and student development objectives mapped to SSC space cybersecurity needs.
- Frequency and quality of updates to these objectives when SSC mission, technology, or policy changes.

### **Curriculum and educational delivery**

- Percentage of courses and programs formally verified as aligned with CHIRP/SSC objectives.
- Student performance in key CHIRP-aligned courses, labs, and capstones.

### **Talent pipeline and student support**

- Number and quality of recruited students who meet CHIRP and future employment requirements.
- Retention, progression, and graduation rates of CHIRP students.
- Utilization and effectiveness of advising, mentoring, and academic support.
- Percentage of graduates placed into SSC/Space Force or related cyber roles.

### **Research relevance and utilization**

- Number of joint CHIRP/academic/SSC research projects tied to mission-aligned problem statements.
- Timeliness of research initiation after SSC needs are identified.
- Deliverables produced (prototypes, tools, methods, analyses) and evidence of evaluation or use by SSC.

### **Engagement and communication**

- Frequency and participation levels in technical briefings, mentorship sessions, and base visits.
- Feedback from students, faculty, and SSC personnel on the usefulness of these engagements.
- Timeliness and completeness of student progress reports from academic partners and reviews by CHIRP leadership.

## A.2 Academic Engagement

CHIRP engagement with academic partnerships is the cornerstone of successful collaboration efforts with higher educational institutions. Academic partners have elevated the experience for CHIRP students by providing additional educational avenues, research facilities and equipment, and soft skills for working with SSC. With adjustments to current curricula, the academic partners have enabled CHIRP to be prepared for roles in space cybersecurity. This Engagement Strategy brief outlines how CHIRP has collaborated with academic partners to advance space cybersecurity education, research, and workforce development in alignment with SSC priorities.

Academic partners play an additional role in the student recruitment efforts, student development, and monthly progress reporting to ensure students are prepared for their future employment obligations.

### **Strategic Objectives include:**

- **Aligning Academic Programs with SSC Mission Needs**
  - Ensuring degree programs (e.g., computer science, cybersecurity, engineering) and research activities are aligned with CHIRP objectives and SSC's immediate cybersecurity priorities.
- **Strengthening Student Development and Workforce Readiness**
  - Delivering coordinated academic, research, and mentoring experiences that prepare students for advanced roles supporting the space cybersecurity mission.
- **Leveraging Geographic Proximity to Space Force Bases**
  - Utilizing the strategic location of academic partners near Space Force Bases to provide students with direct engagement with Space Guardians and exposure to real-world mission environments.
- **Enabling Innovation and Emerging Technology Exploration**
  - Supporting ideation and innovation by connecting academic partners with SSC's research capabilities, state-of-the-art technologies, and collaboration networks.
- **Maintaining Responsiveness to Policy and Operational Changes**
  - Continuously adjusting research themes and academic expectations in response and SSC evolving operational needs.

## A.3 Engagement Mechanisms

### **Strategic Relationship Management**

Strategic relationship management provides the structure that keeps CHIRP, SSC, and academic partners aligned as missions, technologies, and policies evolve. By combining recurring joint forums with clear, formal agreements, the partnership can routinely assess performance, recalibrate priorities, and address emerging needs in a deliberate, coordinated way. Biannual institution-level alignment meetings are designed to support MOUs/MOAs and a governance framework that will translate high-level mission objectives into concrete academic, research, and student development actions across all participating institutions.

Assessing the strength of CHIRP's strategic relationships requires focusing on how well these structures translate intent into coordinated action. The biannual alignment meetings and formal agreements are only valuable if they drive timely decisions, concrete adjustments, and sustain collaboration among CHIRP, SSC, and academic partners. To gauge their effectiveness, CHIRP

will track metrics that capture the reliability of these engagements, the degree of alignment they produce, the follow-through on shared priorities, and the satisfaction of all parties with how the partnership is governed and supported.

### **Summit and meeting effectiveness**

- Percentage of planned Annual Summits and biannual alignment meetings held on schedule.
- Attendance rates and representation (CHIRP, SSC, academic leadership, key faculty).
- Number of actionable decisions, priorities, or tasks documented per meeting.
- Completion rate and timeliness of action items before the next meeting cycle.

### **Alignment and responsiveness**

- Time for adjusting SSC mission alignment to corresponding curriculum or research updates.
- Number of courses, degree pathways, and research topics updated or created as a direct result of alignment meetings.

### **Partnership performance and outcomes**

- Progress against annual goals set at the Partnership Summit (e.g., new courses, research thrusts, student pipeline targets).
- Changes in student outcomes (recruitment, retention, graduation, placement) correlated with partnership decisions.
- Changes in research relevance and utilization (e.g., SSC-evaluated or adopted outputs) are linked to jointly set priorities.

### **Health of formal agreements (MOUs/MOAs)**

- Percentage of partners with current, signed MOUs/MOAs.
- Compliance with agreed roles in student recruitment, reporting, and collaboration processes.
- Number and severity of deviations from agreements, and average time to resolution or amendment.

### **Resource and access effectiveness**

- Identification and fulfillment rate of resource needs raised in alignment meetings (labs, equipment, tools, data access).
- Time from request to provision of agreed resources.
- Utilization rates of shared facilities, tools, or data enabled by the agreements.

### **Stakeholder satisfaction and trust**

- Periodic survey results from CHIRP leadership, SSC representatives, and academic partners on:
  - Clarity of roles and expectations.
  - Quality of communication and transparency.
  - Perceived value of the meeting process and formal agreements.

## **Student Engagement and Development**

This integrated student experience is designed to attract, prepare, and support a mission-ready pipeline of space cybersecurity professionals. Recruitment and selection efforts concentrate on targeted outreach near Space Force bases, using co-branded events to spotlight direct engagement with Space Guardians, state-of-the-art cyber and space systems labs, and clear pathways to advanced roles. Once selected through a standardized, criteria-based process, students follow CHIRP-aligned academic pathways that map core courses and specialized electives to both degree requirements and mission needs. Their learning is reinforced through research and laboratory engagements built around SSC mission-relevant problems and advanced tools, as well as structured mentorship that pairs each student with both a faculty advisor and a CHIRP/SSC mentor. Regular check-ins, a robust speaker series featuring operational experts and alumni, and participation in applied exercises and competitions, such as space-themed cyber ranges, hackathons, and red/blue-team events, ensure that students gain not only technical depth, but also real-world context, professional guidance, and hands-on experience aligned with space cyber defense.

The effectiveness of the student experience will be evaluated by tracking how well it attracts the right candidates, keeps them on track academically, immerses them in mission-relevant learning, and transitions them into space cybersecurity roles. Metrics will focus on the entire pipeline, from outreach and selection through coursework, research, mentorship, and applied experiences, to ensure each component contributes to developing mission-ready talent for SSC and the Space Force.

### **Recruitment and Selection**

- Number and quality of applicants from targeted outreach near Space Force bases.
- Conversion rates from event participation to applications and enrollments.
- Percentage of selected students meeting standardized eligibility criteria (GPA, prerequisites, clearance potential).
- Faculty advisor participation in recommending candidates and the success rate of those recommendations.

### **Academic Pathways**

- On-time progression toward degree completion and CHIRP requirements.
- Student performance in core and elective CHIRP courses (grades, competency assessments).

### **Research and Laboratory Engagement**

- Number and proportion of CHIRP students participating in mission-relevant research or lab projects.
- Use of advanced tools and environments in student work (e.g., documented labs, project artifacts).
- Deliverables tied to SSC problem statements (posters, reports, prototypes) and SSC feedback on quality and relevance.

### **Mentorship and Support**

- Percentage of students assigned both a faculty advisor and CHIRP/SSC mentor.
- Frequency and completion rate of scheduled check-ins (weekly).

- Early identification and remediation of at-risk students.
- Student feedback on the usefulness of advising and mentorship for academic, research, and career decisions.

### **Speaker Series and Panels**

- Number of guest lectures and panels held per term or throughout the year.
- Diversity of speakers (Space Guardians, SSC leaders, technical experts, alumni).
- Attendance rates and repeat participation by students.
- Post-event survey results in perceived relevance, insight into missions, and impact on career interest.

### **Applied Exercises and Competitions**

- Number and scale of CHIRP/SSC-sponsored cyber ranges, hackathons, CTFs, and red/blue-team events.
- Student participation rates and performance in these activities.
- Integration of exercise outcomes into research.
- SSC and faculty assessments of how well these exercises simulate realistic space cyber threat environments.

### **Feedback Mechanisms**

Continuous improvement of CHIRP depends on capturing and acting on feedback from the people who experience and deliver the program every day. By using structured surveys and focus groups with students, faculty, and administrators, CHIRP can identify what is working well, where gaps exist, and how engagement mechanisms and support structures should evolve to stay mission-aligned and effective. The following metrics will be used to assess the success of these feedback mechanisms and their impact on the program.

#### **Implementation and participation**

- Percentage of planned surveys conducted.
- Response rates among students, faculty, SSC and mentors.

#### **Feedback quality and relevance**

- Coverage of key domains: curriculum relevance, mentoring quality, alignment with SSC mission needs, resourcing, and collaboration effectiveness.
- Identification of recurring themes or issues.

#### **Action and follow-through**

- Number of changes to curriculum, mentoring structures, engagement activities, or resources directly linked to survey findings.
- Time from feedback collection to communication of findings and implementation of improvement actions.
- Tracking of whether previously identified issues are resolved or show measurable improvement in subsequent feedback cycles.

#### **Perceived impact of improvements**

- Changes in satisfaction scores for students (program experience, mentoring, curriculum relevance).
- Changes in faculty, student, CHIRP, and SSC perceptions of alignment with mission needs, resourcing, and collaboration effectiveness.
- Qualitative feedback indicating increased clarity, support, and program value following implemented changes.

## **A.4 Industry Engagement**

Contracted industry partners extend CHIRP’s impact beyond the classroom and government mission environment by connecting students and faculty directly to current technologies, practices, and career pathways in the space cybersecurity sector. Through structured collaborations, these partners provide access to tools and testbeds, define real-world problem sets, co-supervise research and capstone projects, and offer internships and mentorship that mirror professional expectations. Guided by clear strategic objectives and defined roles for CHIRP leadership, industry, and academic partners, this framework ensures that industry engagement is not ad hoc but systematically aligned with CHIRP’s mission to develop mission-ready talent and foster innovation in space cybersecurity. The following sections outline how these partnerships are organized, managed, and leveraged to enhance technology integration, research relevance, and student career readiness.

### **Strategic Objectives**

- Integrate industry relevant technologies and practices to ensure that students have exposure to the tools, platforms, and methodologies currently in use in the space and cybersecurity industries.
- Provide real-world research and development pathways that align with student research and projects with current industry challenges and opportunities in space cybersecurity.
- Enhance student career readiness and placement by offering meaningful mentorship, internships, and professional development experiences that enable students to transition smoothly into industry and related defense roles.
- Foster long-term collaboration and innovation by building partnerships that support continuous innovation in space cybersecurity, benefiting CHIRP, industry partners, and the broader mission space.

### **Stakeholder Roles and Responsibilities**

#### **CHIRP Leadership**

- Identify and prioritize technology and expertise needs that can be addressed through industry partnerships.
- Coordinate the integration of industry tools and practices into academic and research activities.
- Facilitate communication and alignment between industry partners, academic partners, and SSC.
- Monitor partnership outcomes (e.g., internships, research outputs, student placement) and adjust engagement mechanisms as needed.

#### **Contracted Industry Partners**

- Provide access to technologies, platforms, tools, testbeds, or datasets relevant to space cybersecurity, as permissible under contractual and security constraints.
- Offer real-world research pathways, including co-defined project topics and problem sets.
- Offer summer internship placements for CHIRP students prior to graduation.
- Provide insight into the professional landscape, including skills in demand, career paths, and organizational expectations.
- Participate in program activities such as workshops, seminars, and advisory sessions.

### **Strategic Partnership Management**

- Review outcomes of the previous year’s collaboration (internships, research, technology integration).
- Identify upcoming technical and capability needs in space cybersecurity.
- Define or refine research themes and internship focus areas.
- Coordinate expectations for student engagement.

### **Regular Coordination Meetings (Quarterly or Semiannual)**

- Track ongoing projects and internships.
- Discuss technological updates and potential integrations.
- Resolve issues related to access, security, or logistics.

### **Partnership Agreements (CRADA’s)**

- Types of technologies and support to be provided.
- Internship offerings, selection processes, and approximate capacity.
- Expectations for student mentorship and events participation.
- Guidelines for IP, non-disclosure, and publication (as applicable).

### **Technology Access and Demonstrations**

- Access (direct or simulated) to industry-standard cybersecurity and space systems tools.
- Technology demonstrations, including hands-on labs or sandbox environments, where possible.
- Arrange periodic “technology deep dives” where industry experts introduce tools and frameworks relevant to space cybersecurity operations.

### **Lab and Testbed Collaboration**

- Align CHIRP academic labs and research projects with partner technologies to the extent feasible.
- Explore opportunities for:
  - Remote access to partner testbeds or simulated environments.
  - Joint experimentation and validation of cybersecurity approach relevant to space assets and supporting infrastructure.

### **Technology Roadmap Alignment**

- Periodically brief CHIRP and academic partners on partner technology roadmaps (at an appropriate level) to anticipate new skills and knowledge areas students should develop.

### **Industry-Defined Problem Statements**

- Collaborate with industry partners to create problem statements for:
  - Student research projects.
  - Capstone design efforts.
- Emphasize practical, mission-relevant challenges in space cybersecurity (e.g., securing satellite communications, protecting ground stations, resilient architecture).

### **Professional Skills Workshops**

- Partner with industry to deliver sessions on:
  - Working in space and cybersecurity industries (culture, expectations, teams).
  - Resume building, interviewing, and job search strategies.
  - Technical topics aligned with partner expertise (e.g., secure software engineering, cyber threat hunting, cloud and space systems security).

### **Career Landscape Orientation**

- Facilitate sessions where industry partners describe:
  - Job roles and career paths in their organizations and across the sector.
  - Required competencies (technical and soft skills) for various roles.
  - Trends affecting the future of space cybersecurity (e.g., automation, AI, new architecture).

### **Structured Summer Internship Programs**

- Coordinate with partners to define CHIRP-focused internship opportunities that:
  - Involve space cybersecurity or closely related work.
  - Provide meaningful, project-based experiences.
  - Include mentorship, performance feedback, and exposure to multiple teams or functions when possible.

### **Post-Internship Reintegration**

- Encourage students to:
  - Present on their experiences to peers and faculty, highlighting lessons learned.
  - Feed their practical experiences back into research, capstone, or coursework.
- Gather feedback from both students and industry supervisors to refine future internship cycles.

### **Annual Review and Planning**

- Conduct an annual review of industry engagement outcomes, including:
  - Technology integration effectiveness.
  - Research and project outputs.

- Internship success and student placement metrics.
- Use findings to update annual partnership objectives, target areas for new collaboration, and resource requirements.

### **Pilot Initiatives**

- Pilot new engagement models with selected partners (e.g., year-long co-op programs, joint research labs, remote industry-lab access).
- Assess impact and scalability; expand successful models across additional partners.

The value of CHIRP's industry partnerships depends on whether they meaningfully enhance technology integration, research relevance, and student career readiness, not just whether activities occur on paper. To evaluate this, CHIRP will use a set of integrated metrics that track how well leadership and contracted industry partners collectively deliver on their responsibilities. These measures will focus on the breadth and depth of technology access, the quality and impact of joint research and lab work, the effectiveness of internships and professional preparation, and the strength of ongoing coordination and governance.

### **Technology Access and Integration**

- Number and type of industry tools, platforms, and datasets made available to CHIRP and academic partners.
- Courses, labs, and projects that actively use partner technologies.
- Student and faculty ratings of the relevance and usability of provided tools.
- Time from agreement to actual deployment/use of technologies in labs or coursework.

### **Research, Labs, and Problem Statements**

- Number of industry-defined problem statements used for student research and capstones.
- Count of joint research projects, co-supervised capstones, and lab collaborations.
- Research outputs (prototypes, reports, code, experiments) tied directly to partner challenges.
- Partner feedback on the operational relevance and quality of student projects.

### **Internships and Experiential Learning**

- Number of CHIRP-focused internships offered and filled each year.
- Percentage of internships involving space cybersecurity or closely related work.
- Student evaluations of internship quality (mentorship, project substance, exposure).
- Industry supervisor evaluations of intern performance and preparedness.
- Post-internship placement rates into industry, SSC, or related defense roles.

### **Mentorship, Workshops, and Career Preparation**

- Count of professional skills workshops, technology deep dives, and career orientation sessions are held annually.
- Student attendance and repeat participation in these events.
- Student self-assessment of improved career readiness and understanding of the industry landscape.

## **Partnership Management and Governance**

- Number and timeliness of regular coordination meetings held (quarterly/semiannual).
- Completion rate of action items emerging from coordination meetings and annual reviews.
- Percentage of active partners with current partnership agreements in place.
- Compliance with agreed commitments (technologies provided, internship slots, event participation).

## **Outcomes and Continuous Improvement**

- Year-over-year growth in:
  - technologies/tools integrated,
  - joint projects,
  - internships, and
  - student placements with partners.
- Qualitative feedback from students, faculty, and industry on what is working and where gaps remain.
- Number of pilot initiatives launched, and proportion scaled up after positive evaluation.

## **A.5 Community Organization Engagement**

Community engagement partners extend CHIRP's impact beyond campus and mission environments by connecting students and their work to the broader public, professional, and educational ecosystems. Through talks, demonstrations, outreach events, and joint activities, these organizations provide authentic platforms for students to showcase space cybersecurity research, practice communication and leadership skills, and see how their work fits into wider societal and security challenges. At the same time, this engagement elevates CHIRP's visibility, strengthens its reputation, and opens new avenues for collaboration, talent development, and ecosystem participation. The following framework outlines how these relationships will be structured, supported, and leveraged to benefit students, partners, and the broader cybersecurity community.

### **Strategic Objectives**

- Showcase student research and impact by providing students with structured opportunities to present their space cybersecurity work to community audiences.
- Foster civic responsibility and relevance by helping students understand how their research connects to wider societal, technological, and security challenges.
- Build program visibility and reputation by increasing awareness of CHIRP's mission, accomplishments, and opportunities within the cybersecurity and space communities.
- Create new engagement and collaboration pathways by utilizing community outreach opportunities to spark additional partnerships, projects, and talent pipeline opportunities.

### **CHIRP Leadership**

Coordinate outreach and event participation, ensure messaging aligns with CHIRP and SSC goals, and continually refine engagement strategies based on tracked outcomes.

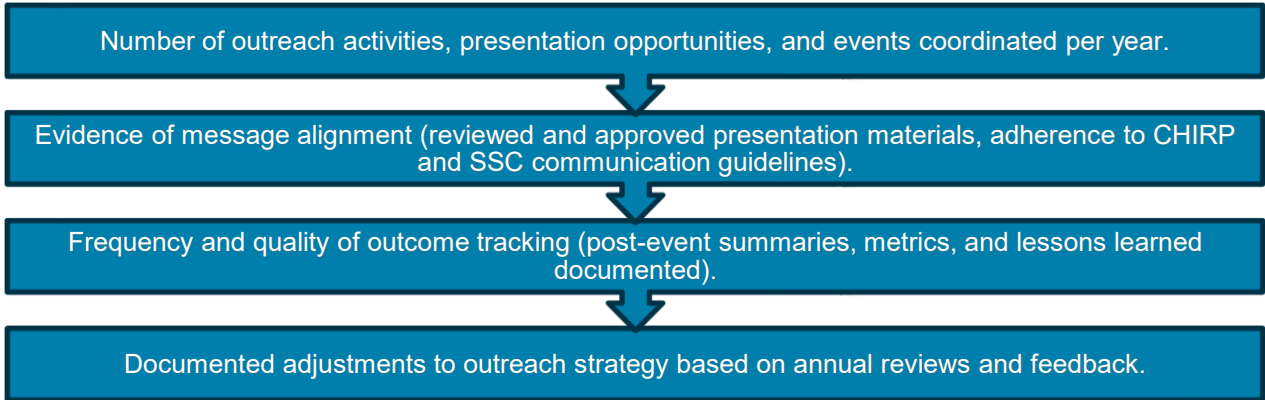


Figure 13 Leadership Metrics

**Community Engagement Organizations**

Offer opportunities for CHIRP students to present and interact with community stakeholders through various events and platforms.

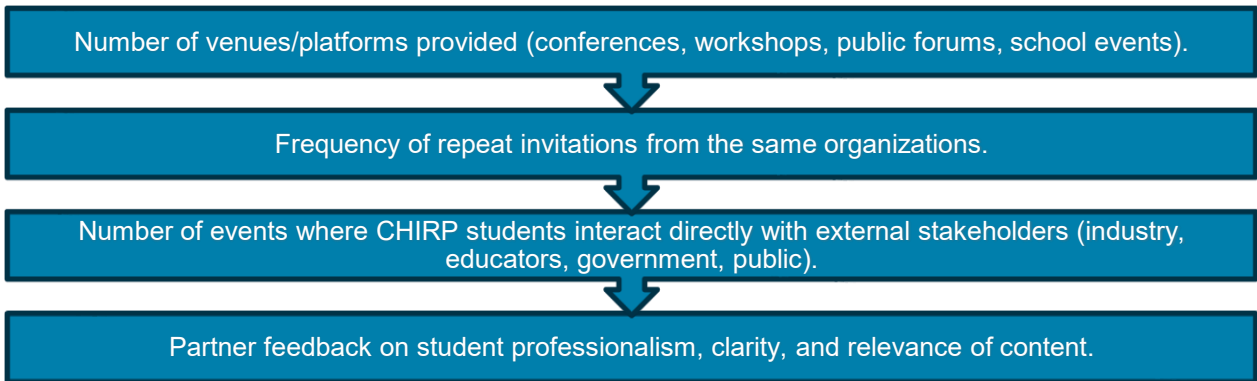


Figure 14 Community Engagement Metrics

**CHIRP Students and Academic Partners**

Present research and projects clearly to community audiences, professionally represent CHIRP and its mission, and incorporate community feedback into ongoing work and professional growth.

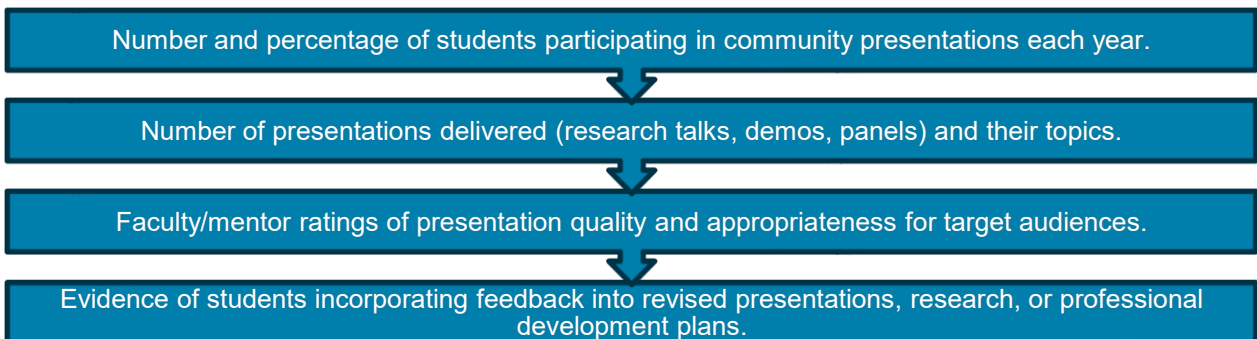


Figure 15 Student and Academic Metrics

## Educational Outreach

Support students in delivering introductory sessions on cybersecurity and space systems for schools or youth programs by providing hands-on activities or demonstrations that encourage interest in space cybersecurity careers.

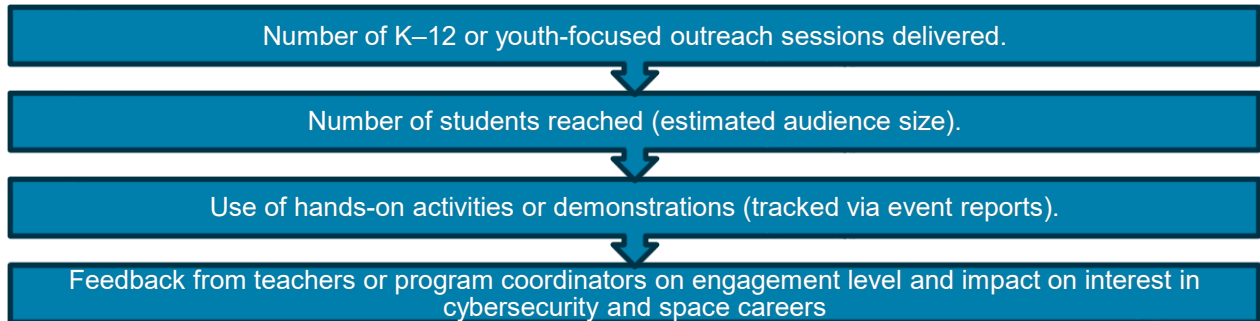


Figure 16 Educational Outreach Metrics

## Communication and Professional Skills

Provide coaching and support so students can tailor their message to varied audiences (technical, non-technical, youth, community leaders) and enhance their public-speaking, storytelling, and outreach skills.

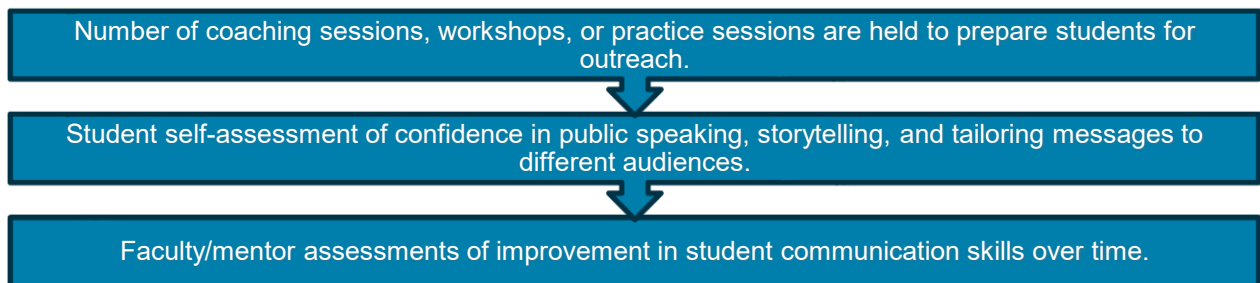


Figure 17 Communication and Professional Metrics

## Feedback Integration

Gather feedback from community events (organizers, attendees) and share with students and use the feedback to improve their future presentations and help students refine how they frame and communicate their work.

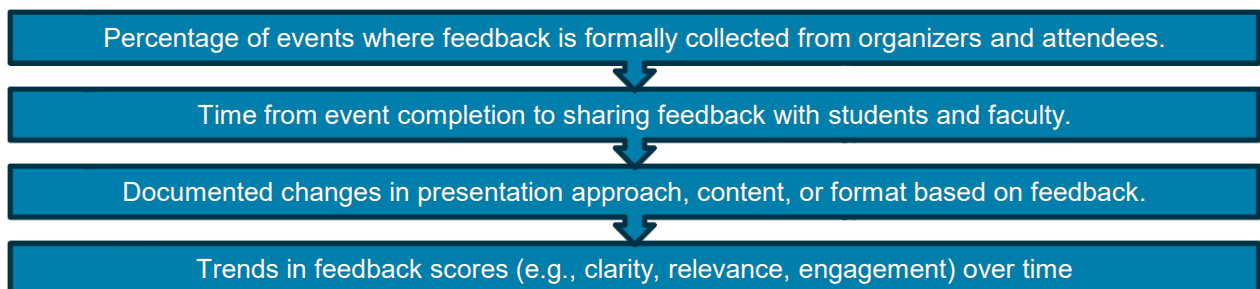


Figure 18 Feedback Metrics

## Awareness of CHIRP and Its Commitments

Use community engagements to communicate CHIRP's mission and focus on space cybersecurity, the program's commitment to student success and professional development, and the role of academic, industry, federal, and training partners.

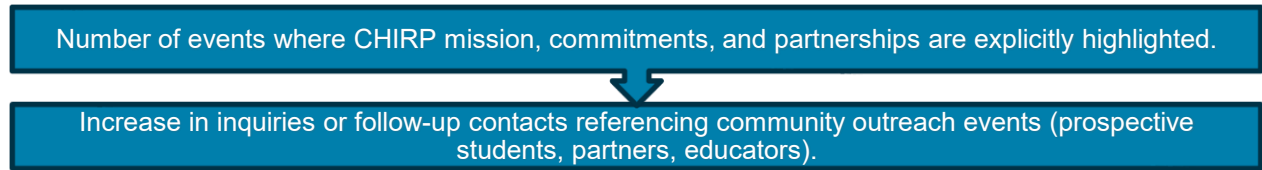


Figure 19 Awareness and Commitments Metrics

## Planning and Coordination

Develop an annual outreach plan detailing target events and partner organizations, with anticipated number of students and types of presentations that include key messages for the year.

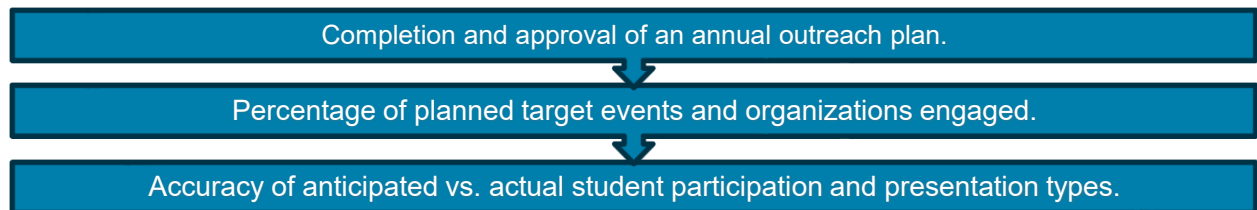


Figure 20 Planning and Coordination Metrics

## Annual Review

Conduct an annual review of community engagement activities to assess the alignment with CHIRP goals and student development needs and its effectiveness in raising awareness and generating new opportunities for students.

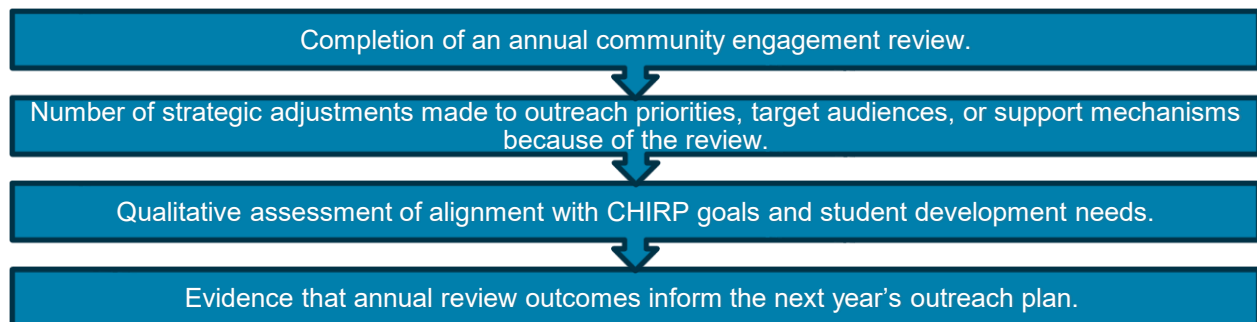


Figure 21 Annual Review Metrics

Evaluating the impact of CHIRP's community engagement activities will focus on whether they meaningfully benefit students, strengthen CHIRP's visibility, and create new connections across the broader cybersecurity ecosystem. Metrics will look beyond simple event counts to assess the quality of student experiences, the reach and resonance of outreach efforts, and the extent to which community engagements generate follow-on opportunities and partnerships.

# Appendix B Student Expectations Documentation

## Overview

### What will CHIRP offer?

CHIRP will offer the following throughout the program:

- Tuition/Fees/Books (if needed)
- Housing stipend (more information below)
- Professional Development Opportunities
- Hands-on research experience
- Mentoring (with PNNL & SSC)
- Federal resume development
- Post-graduation assistance with employment searches

### What is required of me to fulfill my CHIRP commitment?

In alignment with your SSC service agreement (the document you signed with SSC):

- Begin actively seeking post-graduation employment six (6) months prior to graduation.
  - Internships with Federal agencies may qualify.
- Apply and seek full-time employment in a qualifying position at SSC or with an SSC-approved partner.
  - Completion of the application tracking document weekly will determine if a good faith effort was made.
- Work full-time for a period commensurate with the length of the tuition remission or for one year, whichever is longer.
- The service agreement outlines conditions under which reimbursement may not be required.

## School

### How many credits do I need to enroll in?

During the regular academic year, you should take enough credits to be considered a full-time student.

### What GPA do I need to maintain?

You must maintain a 3.0 GPA or above during your time in the program. A student falling below this line will be placed on academic probation and may be limited in the type of program activities they are allowed to participate in.

### Can I take classes over a break?

Yes, you may take classes over a break. Please talk with your academic advisor to make sure any classes align with graduation requirements, and your student liaison and your team lead to make sure you are balancing your courseload and your internship appropriately.

### Time Charging

These time billing guidelines are derived from state laws, PNNL policies, and CHIRP policies.

### How many hours can I work each week?

- You may charge up to 20 hours per week, regardless of whether you have classes or not.
- There is some flexibility to this. For example, if you charge less than 20 hours in one week and need some additional time in another week to work on your CHIRP deliverables, you can request approval from CHIRP leadership to work the extra hours to make it average out to 20 hours per week. This **must** be requested before you work the extra hours and is limited to work on CHIRP deliverables. Charging extra time for homework will not be approved.
- Any time charged should prioritize work on CHIRP research and related deliverables before time is charged for work on approved coursework.

### **How many hours can I work each day?**

On days that you work, you may work up to 8 hours (except for weekends – see below).

### **Do I have to work during a specific time of the day?**

- Tasks given by PNNL or SSC should be completed during regular business hours (6am-6pm, Monday-Friday) local time.
- We understand that juggling classes and other responsibilities means that sometimes you may be charging time outside regular business hours for work on preapproved coursework. You may work at what time works for you on the days that you work (e.g., early in the morning or later at night). Please do not work past midnight.
- Please note that support from SSC, CHIRP staff and mentors may be limited to regular working hours, which are generally 6am-6pm PST, Monday-Friday. If these hours differ for a staff member due to location or other commitments, impacted CHIRP students will be notified.

### **Which charge code/work package do I charge my time to on my timecard?**

- Attending classes is expected and those times are not available for chargeable hours.
- All tasks for SSC are considered chargeable hours and can be documented on your timecard with the CHIRPies work package number.
- You may charge up to half of your time each week to the PDM work package, working on preapproved coursework outside of the classroom. For example, if you work 10 hours one week, then 5 of that may be on coursework. If you work 20 hours, then 10 may be spent on coursework.
- All additional PD requests beyond the preapproved coursework must be submitted and approved by CHIRP leadership **BEFORE** you can charge time or resources to the PD charge code.

These WP#'s are provided through the program aligned with project funding provided specifically to CHIRP. There should never be charging outside of project funds unless explicitly asked to do so.

### **Can I have another job while I'm part of CHIRP?**

- While you are a part of CHIRP, you should consider school and CHIRP to be your jobs. While we cannot stop you from seeking additional employment, please be aware that you are still responsible for meeting all program requirements, deadlines, and deliverables, including working full-time (40hrs/week) during the summer if asked to. If

other commitments (including outside employment) interfere with your ability to be successful in school or CHIRP work, you may be placed on probation and risk removal from the program.

- In general, any additional paid positions and certain unpaid positions must be reported through the PNNL Activity Disclosure form. Reach out to your Team Lead for guidance.

### **Can I work on the weekend?**

- Any SSC work or any CHIRP assigned tasks **must** be completed Monday-Friday.
- During summer and other school breaks, all work must be completed Monday-Friday. Prior approval is required for any CHIRP related work on the weekends during school breaks.
- When school is in session, you may work up to 4 hours on preapproved coursework **either** Saturday or Sunday (not both). Time charged on weekends must be limited to a single day.
- You may only work up to 6 days in a row. For example, if you charge time for coursework on a Sunday and then work every day during the following week (Monday-Friday), you may not work on Saturday that week.
- CHIRP Leadership encourages you to work no more than 5 days per week (preferably Monday-Friday), when feasible, to manage your work/school/life balance.

### **Can I work on a holiday?**

If it is listed on the PNNL Holiday Calendar on the HR website, then it's a holiday for you, too! You may not work or charge any time on holidays that are observed by the lab.

### **Do I get sick/vacation/jury duty/etc. time?**

- Unfortunately, there is no vacation time accrued, no jury duty time, or paid holidays.
- You accrue one hour of sick time for every 40 hours you work. Talk to your Team Lead for guidance on using sick time.

### **What do I need to do if I need to take time off?**

If you are taking time off, please notify the CHIRP inbox, your Team Lead (your manager), mark it on your calendar as Out of Office, and certify your timecard for the week(s) you will be gone. Make sure any deliverables that are due during your time off have been submitted before you leave.

**If you have questions about time charging, please reach out to your Team Lead as soon as possible.**

### **Housing Stipend**

Will I receive a housing stipend?

Yes, you receive a housing stipend. The stipends begin the week classes begin in your junior year. They will be issued for 4 weeks at a time.

### **What if I must take extended leave from school or the program?**

If your leave is 2 weeks or less, you will receive a housing stipend for that time. If your leave is more than 2 weeks, you will not receive a housing stipend for the time you are out. Examples of reasons extended leave might be needed are family emergencies, medical issues, and extended vacations.

When will I stop receiving the housing stipend?

Housing stipends are only available through the end of the month when you graduate with your bachelor's degree (e.g., if you graduate in May, then your last stipend would be for May. Nothing would be received in June).

### **What should I do if I didn't receive a housing stipend when I expected one?**

Please let your student liaison know and they will be able to make sure the appropriate parties are made aware.

### **Travel**

- There will be a few required travel engagements throughout the program. Here are some things to know about traveling for PNNL, beyond the training you will receive.
- Any travel requests for travel outside of the CHIRP required travel must be sent to the CHIRP inbox for approval before an Advanced Travel Request (ATR) is submitted to your team lead.
- After you receive approval from CHIRP leadership, email your team lead and your PNNL admin (name will be given) to request help filling out and submitting an ATR. **Do not fill the ATR out yourself.** An admin will help you with travel arrangements, please do not book anything on your own.
- You will be given a corporate travel card to use **only** on travel related to CHIRP. You will receive statements for this card at your home address, but you do not need to pay for them. PNNL covers the bill if PNNL travel policies are followed (e.g., meals within per diem, ride shares used for business purposes, etc.). Our PNNL admins will handle all billing. Please do check the bills and let your TL know if any amounts appear for more than one month.
- You are expected to bring your PNNL laptop, charger, and OneKey on any CHIRP required travel. If you are unsure if a trip is considered CHIRP required travel, reach out to your student liaison or mentor for guidance.

### **Operational Security (OPSEC) Reminders**

- All CHIRP assigned work (including SSC tasks) must be completed on your PNNL laptop.
- All CHIRP assigned work (including SSC tasks) must be completed using SSC or PNNL tools.
  - If it's not on your PNNL laptop by default (e.g., Canva) or it's not on the PNNL or SSC networks (e.g., AI other than the PNNL AI Incubator), please check with your student liaison before using these tools for your work.
- All CHIRP research must be saved in the appropriate CHIRP Teams folder.
- All PNNL assets (e.g., laptop, badge, OneKey) must be secured in a safe location when not in use.
- All PNNL assets **must** stay within the United States.
- Do not take PNNL assets on personal travel without explicit approval from CHIRP leadership.

### **Professionalism**

- You are an ambassador for your school, PNNL, and SSC. Please make sure your behavior reflects this responsibility at public engagements, with SSC and PNNL staff you may work with, and with each other.
- If you're unsure how to react or behave in a situation, please reach out to your PNNL mentor or your CHIRP student liaison for guidance. This could be anything from how to write a professional email to how to conduct yourself or what to wear in a certain setting.
- Your PNNL mentor and CHIRP student liaisons will schedule regular check-ins. It is expected that you attend them as they are the best way for the program to directly support you should you need additional help in an area. If you are unable to attend your regular check-ins, please communicate this as soon as possible so it can be rescheduled.
- Make sure you are communicating with your mentors and student liaison to make the right connections before you reach out to other staff members. We want to make sure you are getting the most relevant information for your research and will help you reach out to the right people with questions you may have.
- Please keep your calendar up to date by blocking off any times that you know you will be busy (e.g., classes, appointments, etc.). Please be available if your calendar shows that you are available within the work hours set in Outlook and your Teams status.
- Please accept/decline calendar invites, so meetings can be rescheduled as soon as possible when needed.
- Your PNNL email and Teams account should be checked at least once every scheduled workday (Monday-Friday). This excludes weekends and holidays.
- This program requires you to be able to get a clearance if you are submitted for one. While some activities are legal in some states, we are held up by federal standards and obtaining a clearance is subject to passing a background investigation and a negative drug test (including random drug tests in the future).

### **Points of Contact**

Your student liaison should be considered your first point of contact if you have any questions that don't fit the categories below. Unless it is a sensitive matter, please CC the CHIRP inbox on all inquiries.

#### **CHIRP Student Liaison**

- Professional Development requests
- Questions impacting most/all your cohort.
- Travel requests and logistics (via CHIRP inbox)
- Anything else not on this list

#### **PNNL Mentor**

- Etiquette questions
- Questions impacting an individual student
- Questions impacting students from one school
- Professional development guidance
- Questions and guidance about your PNNL assigned CHIRP research

#### **SSC Mentor**

- Questions related to your SSC work or additional resources you may need during your SSC research

#### **University PI/Admin**

- Class advising & schedules
- Academic support & resources (tutoring resources, writing center referrals, etc.)
- Tuition/books/fees questions
- Research paper review (DC review required prior to sharing, no IR needed)

#### **Team Lead (TL, Your Manager)**

- Time Off
  - Planned time off more than 1 day (vacations, school engagements)
  - Unplanned time off more than 1 day (emergencies, unexpected changes of plans, sick time)
- Time charging questions
- Required PNNL paperwork (e.g., conflict of interest disclosures)
- PNNL approvals such as time billing and requests to travel & related questions (not professional development)

## Appendix C CHIRP ROI

From the program's inception, CHIRP has focused on zero trust, mission assurance, cyber risk management, and emerging threats in the space domain, while also emphasizing workforce development through certifications, technical presentations, and national-level outreach.

4 early industry recognized connections that occurred include:

- **AFCEA L.A. Chapter**- Request to participate in Space Industry Days, student poster session and Guardian Round Table.
- **ISACA L.A. Chapter**- Request to present at university on CHIRP and cybersecurity program objectives. 100 students in attendance.
- **SANS**: Request to develop space cybersecurity training that align with CHIRP cohort work.
- **ISC2**: Development of the early Career Certified in Cyber Certification partnership. Providing the certification for free to CHIRP cohorts.
- **USF University Consortium**: Cohort 1 alumni presented at the annual meeting in Colorado Springs.

### Origins and Early Recognition (Cohort 1: 2022–2024)

In June 2022, the Department of Defense University Consortium for Cybersecurity (DoD-UC2) issued a RFI to the academic community on new cyber technologies in two primary areas:

1. Implementing zero trust at the tactical warfighting edge
2. Managing cyber risks to missions

CHIRP students from California State University San Bernardino (CSUSB) responded to this call and quickly demonstrated the program's potential. The CHIRP Cohort 1 team won first place in the "Managing Cyber Risk to Missions" topic area with their paper, *Micro-Segmentation Using Firewalls in Zero Trust Architecture*. This work explored practical approaches to applying micro-segmentation within zero trust architectures to better protect mission-critical systems.

The team's success led to national visibility. Jason Handen and his faculty advisor, Dr. Vincent Nestler, presented their work at the U.S. Cyber Command Strategy Symposium held at the DoD National Defense University at Fort McNair, Washington, D.C. This early recognition validated CHIRP's model of integrating applied research, operational relevance, and student development in its very first summer.

CHIRP Cohort 1 also engaged directly with live mission environments. Aubrie Kendall and Abigail Gutierrez Cruz participated in the Interim Authorization to Test for the Provenance Chain Network through June 1, 2023. Aubrie completed the program and transitioned to a cybersecurity analyst role at PNNL. Abigail continued collaborating with Maj Mayssonet, supporting the fast-track Authority to Operate (ATO) process for the Provenance Chain capability.

Cohort 1 alumni went on to roles at PNNL and industry, illustrating the program's ability to connect academic training with high-impact cyber missions.

### Cohort 1 Participants and Focus Areas

- **Abigail Gutierrez Cruz (CSUSB)** – Cybersecurity Researcher and Lab Technician, Proof Labs (Colorado Springs)

*CHIRP Research:* Tool Development for Better Information and Awareness of Cyber Attacks in the Space Domain

*5 Certifications:* Certified in Cybersecurity; CompTIA Security+; Certified Ethical Hacker; AI for Cybersecurity & Bug Bounty Hunting; Cloud Security and Audit Fundamentals (Amazon Web Services (AWS), Microsoft Azure, Google Cloud)

*3 Outreach & Presentations:* PNNL TechFest; SSC Cyber Expo, USF University Consortium

Lead developer for Cyber Resilient On-Orbit (CROO), award AFWERX Direct to Phase II.

- **Darlene Tarin (CSUSB)** – Technology Fellow, Curriculum Associates  
*CHIRP Research:* Integrating AI in Space Security: Policy and Ethical Dimensions of Modern Deterrence and Detection  
*Certifications:* Certified in Cybersecurity  
*2 Outreach & Presentations:* PNNL TechFest; SSC Cyber Expo
- **Jason Handen (CSUSB)** – National Security Internship Program Post-Baccalaureate Research Associate, PNNL  
*CHIRP Research:* Contemporary Post-Quantum Cryptography Performance Realities  
*4 Certifications:* CompTIA Security+; Certified in Cybersecurity; Magnet Certified Forensic Examiner; Access Data Certified Examiner for Forensic Toolkit  
*2 Outreach & Presentations:* PNNL TechFest; SSC Cyber Expo
- **Aubrie Kendall (CSUSB)** – Cybersecurity Analyst, PNNL  
*CHIRP Research:* Managing Cyber Risks to Mission; Micro-Segmentation Using Firewalls in Zero Trust Architecture  
*2 Certifications:* Certified in Cybersecurity; CompTIA Security+  
*2 Outreach & Presentations:* PNNL TechFest; SSC Cyber Expo

### **Expansion to Space Cyber and National Laboratory Internships (Cohort 2: 2023–2025)**

Building on the success of the inaugural cohort, CHIRP expanded in 2023. Cohort 2 brought in students from both CSUSB and University of Texas El Paso (UTEP) and placed multiple participants into the Department of Energy’s Science Undergraduate Laboratory Internship (SULI) program at PNNL.

Research themes in this period focused heavily on artificial intelligence for cybersecurity, self-healing satellite systems, data provenance, and quantum-informed approaches to detection and defense. Many projects were conducted under SSC directed research lines, particularly exploring the capabilities and risks of generative AI in operational environments.

Cohort 2 students became highly active in 4 technical conferences and outreach, presenting at:

- Great Minds in STEM (GMiS)
- The Center for Minorities and People with Disabilities in Information Security (CMD-IT)/Tapia Conference
- Women in Cybersecurity (WiCyS)
- Space Industry Days.

Cohort 2 engaged with K–12 communities and broader STEM outreach, reinforcing CHIRP’s commitment to pipeline development.

### **Cohort 2 Participants and Focus Areas**

- **Isabella Garcia (UTEP)**– SULI Intern  
*2 CHIRP Research projects:* Unsupervised Machine Learning for Network Anomaly Detection; Generative AI Capabilities and Risks (SSC Directed Research) (IP pending)  
*7 Outreach & Presentations:* GMiS; CMD-IT/Tapia Conference; Reyes Elementary STEM Expo; PNNL TechFest; SSC Cyber Expo; Google’s Latinx Student Leadership Summit; Women in Cybersecurity 2024 Conference; Space Industry Days
- **Juan Enriquez (CSUSB)**– SULI Intern, PNNL  
*CHIRP Research:* Self-Healing Methods in Satellite Systems; Generative AI Capabilities and Risks (SSC Directed Research)  
*2 Certifications:* Certified in Cybersecurity; Amateur Radio License Technician License  
*4 Outreach & Presentations:* PNNL TechFest; SSC Cyber Expo; GMiS; Space Industry Days
- **Kevin Cadena (UTEP)**– SULI Intern & Post-Graduate Developer  
*CHIRP Research:* Unsupervised Machine Learning for Network Anomaly Detection; Generative AI Capabilities and Risks (SSC Directed Research) (IP pending)  
*Certifications:* Certified in Cybersecurity  
*4 Outreach & Presentations:* GMiS, PNNL TechFest; SSC Cyber Expo; Space Industry Days
- **Viviana Cadena (UTEP)**– Cybersecurity Research Intern, PNNL; Graduate Student  
*CHIRP Research:* Quantum Machine Learning for Intrusion Detection of Distributed Denial-of-Service (DDoS) Attacks; Generative AI Capabilities and Risks (SSC Directed Research)  
*3 Certifications:* GIAC Foundational Cybersecurity Technologies (SANS); Microsoft Technology Associate: Software Development Fundamentals (MTA)  
*7 Outreach & Presentations:* WiCyS; Cybersecurity Camp Coach, Air Force Association; PNNL TechFest; SSC Cyber Expo; GMiS, Space Industry Days
- **Raul Chaidez (UTEP)** – SULI Intern; Graduate Student  
*CHIRP Research:* Data Provenance and Intrusion Detection; Increasing the Accuracy of Intrusion Detection Systems through the Use of Data Provenance; Generative AI Capabilities and Risks (SSC Directed Research)  
*Certifications:* Certified in Cybersecurity  
*4 Outreach & Presentations:* PNNL TechFest; SSC Cyber Expo; GMiS; Space Industry Days

### **Emerging Focus on AI, Resilience, and Space Systems (Cohort 3: 2024–Present)**

Cohort 3 represents CHIRP’s continued evolution toward contested space operations, resilient architecture, and hybrid communication systems. Beginning in 2024, the program expanded to include California State University Dominguez Hills (CSUDH) alongside CSUSB and UTEP, while planning additional SULI placements and billets in Los Angeles and El Paso.

Cohort 3 projects emphasize AI-enabled anomaly detection for space systems, resilient system design, hybrid satellite–fiber communications, and the cyber-physical risks associated with satellite-to-satellite operations and space debris. Many participants are actively engaged in Space Force AI Challenge projects with Guardian mentors, deepening their connection to operational space missions.

### **Cohort 3 Participants and Focus Areas**

- **Amias Ainsworth (CSUSB)**  
*CHIRP Research:* Futuristic Outlook of Hybrid Communications Between Satellite and

Fiber

2 *Outreach & Presentations*: Space Force AI Challenge projects with Guardian mentors;  
Space Industry Days

- **Camilah Anguiano (CSUDH)**

*CHIRP Research*: Resilient Systems

2 *Outreach & Presentations*: Space Force AI Challenge projects with Guardian mentors;  
Space Industry Days

- **Claudia Ramirez (CSUSB)**

*CHIRP Research: Space Jam*: Assessing Security Threats and Risks of Satellite-to-Satellite Proximity in Orbit

2 *Certifications*: CompTIA Security+; Certified in Cybersecurity

2 *Outreach & Presentations*: Space Force AI Challenge projects with Guardian mentors;  
Space Industry Days

- **Diego Acosta (UTEP)**

*CHIRP Research*: AI Anomaly Detection for Space Systems

*Certifications*: Certified in Cybersecurity

4 *Outreach & Presentations*: GMiS; AI in Contested Space Workshop; Space Force AI Challenge projects with Guardian mentors; Space Industry Days

- **Evelyn Mejia (CSUSB)**

*CHIRP Research*: Futuristic Outlook of Hybrid Communications Between Satellite and Fiber

*Certifications*: CompTIA IT Fundamentals

2 *Outreach & Presentations*: Space Force AI Challenge projects with Guardian mentors;  
Space Industry Days

- **Julian Elizondo (CSUSB)**

*CHIRP Research*: Futuristic Outlook of Hybrid Communications Between Satellite and Fiber

*Certifications*: Certified in Cybersecurity

2 *Outreach & Presentations*: Space Force AI Challenge projects with Guardian mentors;  
Space Industry Days

- **Mia Villela (UTEP)**

*CHIRP Research*: AI Anomaly Detection for Space Systems

3 *Certifications*: Certified in Cybersecurity; CompTIA IT Fundamentals; Cybersecurity Fundamentals for Space; Women in Cybersecurity

4 *Outreach & Presentations*: GMiS; AI in Contested Space Workshop; Space Industry Days; Space Force AI Challenge projects with Guardian mentors

- **Priscila Cruz-Garcia (CSUSB)**

*CHIRP Research: Space Jam*: Assessing Security Threats and Risks of Satellite-to-Satellite Proximity in Orbit

3 *Certifications*: Certified in Cybersecurity; CompTIA IT Fundamentals; Cybersecurity Fundamentals for Space

2 *Outreach & Presentations*: Space Force AI Challenge projects with Guardian mentors;  
Space Industry Days

- **Yaritza Chinchilla (CSUDH)**

*CHIRP Research*: Resilient Systems

2 *Outreach & Presentations*: Space Force AI Challenge projects with Guardian mentors;  
Space Industry Days

- **Miguel Padilla (UTEP)**  
*CHIRP Research:* Using AI to Assist in Managing Space Junk  
*2 Outreach & Presentations:* Space Force AI Challenge projects with Guardian mentors;  
Space Industry Days

### **Program Impact and Trajectory**

Across its first three cohorts (2022–present), CHIRP has demonstrated a scalable model for cultivating cyber talent aligned with DoD and space mission needs. Key elements of impact include:

- National recognition through DoD-UC2 and U.S. Cyber Command venues
- Deep integration with PNNL and other national lab environments via SULI and research internships
- A strong emphasis on professional certifications, enhancing employment readiness
- Frequent student participation in national conferences, Air Force and Space Force activities, and K–12 STEM outreach
- A steadily expanding research portfolio in zero trust, AI for cyber defense, post-quantum security, resilient space systems, hybrid communications, and space domain awareness.

## Appendix D CHIRP Leadership R2A2

**ROLE:** CHIRP Program Director

The CHIRP Program Director holds authority over strategic decision-making within CHIRP, encompassing the approval of initiatives, resource allocation, priority adjustments, risk management, and collaboration terms. This position ensures that all program activities are aligned with SSC S6's overarching mission and objectives. The Director's decisions are supported by coordinated efforts with SSC S6, with dedicated program staff and leads being provided with necessary resources to execute their responsibilities effectively. Through systematic feedback integration and regular strategic reviews, the Director decisively manages all aspects of the program to foster continuous improvement and responsiveness to the evolving strategic mission needs of SSC S6.

**Reporting Lines:** The CHIRP Program Director reports to SSC S6 management responsible for overseeing the program's broader strategic alignment with SSC S6's mission and goals. This ensures that the Director's actions are in line with SSC S6's strategic mission and provides a line of accountability for program outcomes and strategic alignment.

The CHIRP Program Director will avoid micromanaging daily operations, focusing instead on strategic oversight and long-term planning and leave detailed paperwork and routine support to designated team members.

Responsibilities	Delivery	Measurement	Accountability	Authority
Strategic Approvals	Formulation and approval of strategic CHIRP objectives in alignment with SSC's mission.	Evaluation of CHIRP alignment with objectives and impact on program goals.	Ensure CHIRP contributes to strategic goals; report progress and outcomes to SSC S6.	Sole discretion to approve or reject CHIRP strategies based on SSC S6 mission alignment
Resource Allocation	Equitably and efficiently distribute resources to CHIRP program needs.	Efficiency and effectiveness of resource use, demonstrating value for CHIRP investment.	Must optimize resources to meet CHIRP objectives and control budgetary expenditures.	Final say in how and where resources are allocated within CHIRP.
CHIRP Priority Adjustments	Continuous assessment and realignment of CHIRP priorities as needed	Adaptability to changes in SSC S6 needs and emerging trends.	Ensure timely and relevant adjustments that advance CHIRP success.	Make decisive adjustments to priorities to maintain or enhance focus.

Risk Management	Identify, assess, and mitigate risks to CHIRP success proactively.	Frequency and severity of risks successfully managed or avoided.	Protect CHIRP assets and objectives by implementing risk mitigation strategies.	Authority to enact immediate and strategic interventions to manage risks.
Collaboration	Negotiate terms of partnerships and collaborations with external entities (e.g., universities, USSF, DoD, contracted partners, other government entities, etc.).	Quality and success of collaborations, reflected in CHIRP outcomes.	Ensure partnerships enhance capabilities and do not dilute focus or resources.	Authority to establish and finalize collaboration agreements.
CHIRP Development and Implementation	Development and implementation of detailed and effective CHIRP development and implementations plan.	Timeliness and effectiveness in achieving planned objectives.	Deliver CHIRP objectives on schedule and within scope, accountable for implementation success.	Lead and oversee the entire planning and implementation process.
SSC S6 Coordination	Facilitate effective communication and coordination with SSC S6 and partners.	SSC S6 and partner engagement levels and satisfaction.	Ensure positive relationships that support program success.	Direct interaction with SSC S6 and partners to drive program goals.
Monitoring and Evaluation	Continuously monitor and evaluate CHIRP outcomes against objectives.	Quantitative and qualitative assessments of outcomes and impacts.	Accountable for achieving set targets and making improvements	Direct the monitoring processes and dictate necessary modifications.
CHIRP team Supervision and Support	Provide oversight, training, and support to the CHIRP team.	CHIRP team performance and development; achievement of the CHIRP team objectives.	Ensure the CHIRP team are well-equipped and supported to perform effectively.	Recruit and manage the CHIRP team to foster an effective team environment.

Feedback Integration	Integrated continuous feedback into the strategic decision-making process.	Responsiveness to feedback; improvement in processes and outcomes.	Ensure that feedback leads to actionable improvements.	Incorporate feedback into strategic planning and CHIRP mission goals.
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**ROLE:** CHIRP Deputy Program Director

The CHIRP Deputy Program Director is responsible for assisting the CHIRP Program Director in executing strategic initiatives and ensuring efficient operation and alignment with organizational objectives. This role involves facilitating resource allocation, monitoring CHIRP priorities, assessing risks, implementing CHIRP plans, engaging with external entities, and supervising CHIRP team training and support. The Deputy Director is integral to maintaining CHIRP momentum and responsiveness, acting under the guidance and authority of the CHIRP Program Director.

**Reporting Lines:** The CHIRP Deputy Program Director reports directly to the CHIRP Program Director, providing inputs and updates on program progress while ensuring that strategic decisions are implemented effectively.

The CHIRP Deputy Program Director will not override or conflict with decisions made by the CHIRP Program Director to ensure supportive collaboration and maintain a balance between tactical execution and strategic support.

Responsibility	Delivery	Measurement	Accountability	Authority
Support Strategic CHIRP Initiatives	Assist in the development and implementation of CHIRP strategic initiatives approved by the Program Director.	Contribution to initiative execution and alignment with CHIRP goals.	Ensure CHIRP initiatives are executed according to plans; provide regular updates to the CHIRP Program Director.	Authority to implement initiatives within the scope provided by the CHIRP Program Director.
Assist Resource Allocation	Support resource distribution by managing allocations and adjustments as directed.	Resource management effectiveness and efficiency under guidance.	Ensure resources are optimized in line with CHIRP strategic objectives; report discrepancies or needs.	Ability to propose resource adjustments; execute allocation as delegated.
Monitor CHIRP Priorities	Track CHIRP priorities and suggest adjustments in	Responsiveness to strategic needs and adaptive recommendations.	Provide informed suggestions that enhance focus and CHIRP adaptability.	Support priority shifts; recommend changes to

	response to changing conditions.			the CHIRP Program Director.
Risk Assessment Support	Assist in identifying and evaluating potential risks to CHIRP success.	Contribution to risk identification and assessment accuracy.	Provide comprehensive insight into risk factors and ensure timely communication with the CHIRP Program Director.	Recommend risk management strategies; execute actions as approved.
Collaboration	Assist in negotiations and maintain relationships with external entities (e.g., universities, USSF, DoD, industry, other government entities, etc.) under the guidance of the Program Director.	Success and effectiveness of partnership support and maintenance.	Ensure partnership terms are upheld, and relationships are mutually beneficial.	Engage with partners within defined parameters.
Implement CHIRP Plans	Collaborate in developing and executing CHIRP plans directed by the CHIRP Program Director.	Efficiency of planning implementation and achievement of deliverables.	Support the CHIRP Program Director in ensuring timely and effective program execution.	Guide plan execution; coordinate CHIRP teams under direction.
SSC S6 Coordination Engagement	Maintain active engagement and communication channels with SSC S6.	Level of engagement and satisfaction with SSC S6.	Ensure SSC S6 remain informed and engaged with CHIRP development.	Facilitate SSC S6 interactions and meetings as directed.
Measure CHIRP Outcomes	Assist in the monitoring and evaluation of CHIRP outcomes relative to SSC S6 mission objectives.	Accuracy and insight of evaluation reports; impact assessments.	Support CHIRP Program Director in ensuring outcomes meet objectives and provide improvement feedback.	Conduct evaluations and present insights to the CHIRP Program Director.

CHIRP Team Support and Supervision	Provide CHIRP Team supervision and assist with training programs to ensure CHIRP skill development.	CHIRP Team performance improvement and engagement levels.	Ensure CHIRP Team are adequately supported and equipped to meet CHIRP demands.	Guide training initiatives; resolve CHIRP team issues in collaboration with the CHIRP Program Director.
Feedback Collection	Assist in collecting and integrating feedback into CHIRP processes.	Quality and utilization of collected feedback in CHIRP improvements.	Ensure feedback is effectively communicated and utilized to inform strategic adjustments.	Gather and process feedback data; propose integration strategies to the CHIRP Program Director.

**ROLE:** CHIRP Workforce Development Lead

The Workforce Development Lead focuses on enhancing the skills and knowledge of students to meet the demands of SSC and the space cybersecurity mission. They assess the needs of the students (e.g., training, education, support, etc.) by developing opportunities for advancement in their CHIRP journey. They are responsible for evaluating the effectiveness of student interactions and making suggestions for program adjustments to align with the needs of the student experience. They manage the Student Liaison's and mentor's activities to ensure that they have the support they need to provide meaningful and impactful guidance to the students.

**Reporting Lines:** The Workforce Development Lead reports to the CHIRP Program Director and Deputy Director, ensuring that CHIRP workforce development activities are aligned with the CHIRP's strategic mission objectives and effectively contribute to the overall mission of the SSC S6.

The CHIRP Workforce Development Lead will avoid tasks unrelated to workforce training and development, such as unrelated program management or external partner negotiations and CHIRP recruitment will align with PNNL and SSC S6 policies and will not be solely determined by the CHIRP Workforce Development Lead.

Responsibility	Delivery	Measurement	Accountability	Authority
CHIRP Training and Development	Develop and implement CHIRP training to enhance student skills and capabilities.	Improvement in student skills and competencies;	Responsible for ensuring students possess necessary	Authority to design and execute CHIRP

		participation rates in training and conferences.	skills to meet CHIRP goals, report outcomes to CHIRP Program Director.	training modules and initiatives.
CHIRP Skills Gap Analysis	Conduct regular assessments to identify skills gaps for CHIRP students.	Accuracy and insights derived from skills assessments, effectiveness of gap closure strategies.	Ensure CHIRP student skills align with CHIRP demands and SSC S6 mission objectives.	Evaluate CHIRP student capabilities and recommend necessary training needs.
CHIRP Career Development Pathways	Design and implement CHIRP career progression plans to promote CHIRP development and retention.	CHIRP student advancement and retention rates; satisfaction with career development opportunities.	Ensure CHIRP development contributes to SSC S6 mission goals.	Create and oversee career development initiatives within CHIRP.
Recruitment Strategy Support	Collaborate with CHIRP Program Director and CHIRP Deputy Program Director to develop recruitment strategies that align with SSC S6 needs.	Success of recruitment strategies; quality and fit of new CHIRP students.	Ensure recruitment aligns with CHIRP objectives and enhances SSC S6 workforce needs.	Participate in recruiting processes; advise on CHIRP needs and priorities.
CHIRP student Performance Monitoring and Evaluation	Continuously monitor CHIRP student performance and evaluate professional development activities.	CHIRP student performance improvements; impact of training programs on CHIRP objectives.	Accountable for providing feedback on the effectiveness of CHIRP student development activities.	Conduct performance evaluations and suggest improvements to CHIRP student development policies.
Engagement in CHIRP Workforce Development	Establish communication with university lead and mentors regarding CHIRP student needs and development objectives.	Engagement levels and satisfaction among CHIRP students	Ensure university lead and mentors expectations are met and CHIRP development activities	Engage with university lead and mentors to align workforce initiatives with

		and university, and mentors.	support broader CHIRP goals.	CHIRP student needs.
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**ROLE: CHIRP Student Lead**

A CHIRP Student Lead focuses on managing and enhancing the experience and involvement of students through projects and professional development by concentrating on the individual development and integration of students into CHIRP.

**Reporting Lines:** The CHIRP Student Lead would report to the Workforce Development Lead, ensuring that student-focused CHIRP initiatives align with the CHIRP’s strategic mission goals. This allows for a cohesive approach where student engagement, professional development, and integration substantively contribute to program objectives.

The CHIRP Student Lead will avoid activities that do not directly involve student engagement, support, or professional development and the CHIRP Student Lead will support mentorship facilitation but not directly manage those relationships. The CHIRP student lead will assist in the review of draft materials and projects that align with SSC S6 priorities and deliverables, iteratively until they are ready for DC review and submission. The CHIRP student lead will work with the Workforce development lead to establish tasking and timelines and hold students accountable for meeting deliverables and upholding CHIRP responsibilities and expectations.

Responsibility	Delivery	Measurement	Accountability	Authority
CHIRP Student Management	Manage CHIRP students by providing them with practical experience and exposure to SSC S6 and DoD space mission.	Success of CHIRP student participation. Provide documented check-ins on student progress and performance	CHIRP objectives offer valuable learning experience.	Design and implement CHIRP experiences while facilitating CHIRP student engagement.
CHIRP Student Mentoring and Development	Identify mentors and develop pathways to support student learning and professional growth.	Improvement in student skills and competencies; effectiveness and impact of mentoring relationships.	Ensure students receive adequate support to enhance their professional development.	Direct CHIRP mentorship and ensure student access to resources and guidance

CHIRP Student Professional Development	Identify professional development opportunities that enhance CHIRP students' professional skills and prepare them for SSC S6 missions.	Level of CHIRP student participation and professional skill acquisition; feedback on development opportunities	Responsible for fostering CHIRP student readiness for SSC S6 roles through structured professional development activities.	Identify and oversee professional development participation for CHIRP students.
SSC S6 Research Participation	Integrate students into SSC S6 mission projects, leveraging their skills to contribute to mission objectives and learn through participation.	CHIRP student contributions to SSC S6 project success; quality of integration and learning experiences.	Ensure CHIRP student talents are effectively utilized in advancing SSC S6 mission goals and fostering innovation.	Facilitate CHIRP student engagement in SSC S6 mission projects, aligning their contributions with strategic needs.
Engagement and Communication	Maintain communication channels to keep CHIRP <i>students</i> informed and engaged with CHIRP initiatives and opportunities with SSC S6. Maintain communication channels to keep CHIRP <i>Leadership</i> keyed in on student progress	CHIRP student engagement levels, satisfaction, and participation in communications; transparency in updates.	Foster an inclusive environment where CHIRP students feel connected and informed.	Manage communications (e.g., mentors, CHIRP and SSC S6 leadership, university, etc.) with CHIRP students to ensure clarity and active involvement.

**ROLE: CHIRP Mentor**

A CHIRP Mentor guides CHIRP students by providing personalized assistance on SSC S6 projects, research tasks, and communication skills. They offer constructive feedback, facilitate access to SSC S6 and PNNL resources and networks, and assist in setting and achieving CHIRP goals throughout the 2 years in the program.

**Reporting Lines:** The CHIRP Mentors report to the Workforce Development Lead specifically for aspects related to their mentoring role. The Workforce Development Lead provides oversight and ensures that mentoring practices align with the CHIRP's goals, offering mentors the necessary resources and support to enhance their effectiveness. The Workforce Development Lead supports CHIRP Mentors in addressing challenges, aligning CHIRP activities with CHIRP student expectations, and receiving support for CHIRP student guidance and research.

CHIRP Mentors do not manage administrative or operational aspects of CHIRP. They are not responsible for program responsibilities, strategic decisions, or program-level resource allocation. Their primary responsibility is to support intern development, leaving broader program functions to other roles within the organization.

Responsibility	Delivery	Measurement	Accountability	Authority
Providing Insights and Advice	CHIRP Mentors hold regular one-on-one meetings with CHIRP students to discuss research tasks, and communication strategies, offer tailored advice, guidance, introduce best practices, and share insights from experienced professionals with CHIRP students.	Collect feedback from CHIRP students regarding the usefulness of the tailored advice, insights and the impact of guidance provided.	CHIRP Mentors regularly engage with CHIRP students, provide tailored advice, document guidance, and report progress to ensure alignment with CHIRP objectives and CHIRP student development goals.	Schedule and conduct regular one-on-one meetings with CHIRP students to provide guidance and feedback.
Facilitating Communications	CHIRP Mentors curate and distribute relevant materials and industry publications that aid CHIRP students in their research. CHIRP Mentors introduce CHIRP students to	Track the frequency and way CHIRP students utilize distributed materials and	CHIRP Mentors curate and distribute research materials and introduce CHIRP students to cybersecurity professionals	Select relevant research materials and connect CHIRP students with professionals in the cybersecurity field.

	professionals in cybersecurity research to enhance their networking capabilities.	industry publications and the measure of professional connections made by the CHIRP students for their cybersecurity research.	to enhance their research and networking capabilities.	
Constructive Feedback	CHIRP Mentors conduct regular reviews of the progress of CHIRP students, providing detailed feedback on performance, research quality, and communication skills.	Collect feedback from CHIRP students regarding the usefulness of the tailored advice, insights and the impact of guidance provided.	CHIRP Mentors conduct regular progress reviews and provide detailed feedback on CHIRP students' performance, research quality, and communication skills.	Evaluate CHIRP student progress and deliver detailed feedback on their performance.
Assisting in Career Goal Setting	CHIRP Mentors host sessions focused on research planning, self-assessment, and strategy formulation to help CHIRP students set realistic and attainable research goals.	CHIRP students are surveyed before and after sessions to evaluate the realism and attainability of their research goals, while reflective journals, peer and mentor	CHIRP Mentors host sessions on research planning, self-assessment, and strategy formulation to help CHIRP students set realistic and attainable research goals.	Organize and lead sessions on research planning and strategy.

		reviews, and strategic plan evaluations track self-assessment accuracy and strategy effectiveness.		
Personalized Development Plans	CHIRP Mentors conduct evaluations to understand the strengths and areas for improvement of each CHIRP student. Developing personalized growth plans for CHIRP students based on their assessment outcomes and focusing on skill building.	CHIRP Mentors measure each student's strengths and areas for improvement through evaluations, which serve as a baseline for personalized growth plans and tracked skill development.	CHIRP Mentors evaluate CHIRP student strengths and areas for improvement and develop personalized growth plans focused on skill building.	Assess CHIRP student strengths and weaknesses, developing growth plans accordingly.
Networking Opportunities	CHIRP Mentors encourage CHIRP students to participate in or lead collaborative research projects and prepare them for interactions with other researchers and SSC S6.	Track student participation and leadership roles in research projects, interactions with other researchers and successful execution of collaborative tasks.	CHIRP Mentors encourage CHIRP students to participate in or lead collaborative research projects and prepare them for interactions with other researchers and SSC S6.	Promote CHIRP student involvement in collaborative projects and prepare them for research interactions.

Professional Support	CHIRP Mentors maintain availability for CHIRP students to discuss concerns or challenges as they navigate their internship experience.	Track the frequency and accessibility of mentorship interactions, along with resolution rates of concerns and the collection of satisfaction surveys from CHIRP students on the effectiveness of CHIRP Mentor support.	CHIRP Mentors will be available to discuss CHIRP student concerns or challenges during their CHIRP experience.	Make themselves available to discuss and address CHIRP student concerns during internships.
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## Appendix E CHIRP Challenges

The CHIRP program’s early implementation exposed a series of foundational challenges in how partnerships were structured, governed, and managed over time. Misalignment with the initial academic partner, an unstable and evolving SOW, and insufficiently defined collaboration and dispute-resolution mechanisms collectively slowed progress and created friction across internal and external stakeholders. Clearance delays and underdeveloped industry outreach further constrained the program’s ability to execute on schedule and remain tightly aligned with operational and market needs. In response, CHIRP has begun reassessing partner selection, treating the SOW as a living document, clarifying collaboration guidelines, and elevating the importance of structured conflict management, approvals planning, and systematic industry engagement.

The following sections summarize lessons learned to date, outline ongoing remediation efforts, and identify forward-looking risks and actionable plans to strengthen CHIRP’s governance, partnerships, and long-term sustainability.

### E.1 Core Partnership and Program Management Challenges

This table summarizes the primary challenges CHIRP encountered in its core partnership and program management functions. It outlines specific obstacles across contracting, scope management, collaboration practices, dispute resolution, clearance processes, and industry engagement, and highlights how these issues translated into operational impacts such as inefficiencies, delays, misaligned priorities, and missed opportunities with external partners.

Table 9 Core Obstacles

Initial academic partner was not well-aligned with CHIRP’s specific development needs.	<ul style="list-style-type: none"> <li>• Inefficiencies in development activities</li> <li>• Misalignment of priorities and timelines</li> <li>• Slower progress on deliverables</li> </ul>
University requests beyond what was outlined in the SOW and not held to expectations.	<ul style="list-style-type: none"> <li>• Requests out of scope.</li> <li>• Difficulty in holding universities accountable to deliverables</li> </ul>
Collaboration guidelines were not sufficiently defined and not explicitly adaptable.	<ul style="list-style-type: none"> <li>• Unclear expectations between parties</li> <li>• Inconsistent communication and decision-making</li> <li>• Friction between internal and external teams</li> </ul>
No clearly defined dispute resolution mechanism was in place.	<ul style="list-style-type: none"> <li>• Risk of unresolved conflicts escalating</li> <li>• Potential for stalled work or strained relationships</li> <li>• Time lost to informal/inefficient conflict management</li> </ul>

Delays in DoD clearance processes (e.g., lack of access to a defined DoD clearance process, reviews, approvals, security clearances if relevant).

- Bottlenecks in project implementation
- Slippage in milestones and timelines
- Increased pressure on downstream tasks

Industry outreach was underdeveloped; connections with contracted industry partners were not sufficiently strong.

- Limited access to external expertise
- Reduced ability to align CHIRP with market/operational needs
- Missed opportunities for co-development and co-funding

## E.2 Early Remediation Actions and Lessons Learned

This table outlines the initial remediation steps CHIRP has taken in response to early partnership and governance challenges. It captures key lessons learned, such as the need for better partner alignment, adaptable SOWs, clearer collaboration guidelines, formal dispute resolution, proactive clearance planning, and stronger industry outreach, and pairs them with specific actions already underway to improve processes, clarify expectations, and reduce future friction across stakeholders.

Table 10 Remediation Strategy

Recognize the importance of aligning academic partners with program development needs.

- Began reassessing criteria for partner selection (capabilities, experience, responsiveness).
- Initiated adjustments in how the program evaluates fit before formal agreements

Acknowledged that the SOW must be adaptable as CHIRP's scope evolves.

- Started treating the SOW as a living document, subject to periodic review and revision.
- Increased communication around scope changes to better synchronize expectations.

Recognized the need for collaboration guidelines that are both flexible and clearly defined.

- Began clarifying roles, responsibilities, and communication channels among partners.
- Started adjusting guidelines to better reflect changing dynamics while preserving core objectives.

Identified the absence of formal dispute resolution paths as a critical gap.

- Raised awareness among stakeholders that structured conflict management must be built into agreements and governance.

	<ul style="list-style-type: none"> <li>• Early discussions initiated on how to integrate dispute resolution clauses and escalation pathways.</li> </ul>
Highlighted clearance delays as a key lesson learned.	<ul style="list-style-type: none"> <li>• Emphasized the need for earlier and more precise coordination across partners.</li> <li>• Started mapping key approval dependencies to better anticipate bottlenecks.</li> </ul>
Identified industry outreach as a high-priority area needing enhancement.	<ul style="list-style-type: none"> <li>• Started efforts to engage more actively with contracted industry partners.</li> <li>• Began building awareness of the need for ongoing, structured engagement rather than ad hoc interactions.</li> </ul>

### E.3 Opportunities to Strengthen Future Partnerships and CHIRP Governance

This table outlines key opportunities to strengthen CHIRP’s partnership, governance, and execution framework. It highlights areas where alignment with new partners can be deepened, decision-making authority can be clarified, and conflict-resolution processes can be further improved. It also identifies chances to streamline clearance and compliance steps and to actively ensure CHIRP’s development remains closely aligned with evolving SSC S6 Cybersecurity needs.

Table 11 Strengthen Partnerships

Partner Alignment & Contract Structure	<ul style="list-style-type: none"> <li>• Opportunities to strengthen alignment with future partners through proper vetting practices.</li> <li>• Shape contractual obligations so they remain compatible with CHIRP’s evolving requirements.</li> </ul>
Governance & Decision-Making	<ul style="list-style-type: none"> <li>• Clearly define final decision authority on technical and programmatic issues.</li> <li>• Establishment of consistent rules of engagement for internal and external stakeholders to maintain alignment with CHIRP requirements.</li> </ul>
Conflict & Dispute Escalation	<ul style="list-style-type: none"> <li>• The implementation of formal mechanisms that help resolve minor disagreements early and constructively.</li> <li>• Proactively align internal leadership, academic, and industry partner priorities, Intellectual Property, and timelines to prevent conflicts and support collaboration.</li> </ul>

Clearance, Compliance, and Review Timelines	<ul style="list-style-type: none"> <li>Streamline reviews, security, compliance, and clearances to reduce delays in the process.</li> <li>Better align program timelines with program review cycles for smoother execution.</li> </ul>
Industry Engagement and Relevance	<ul style="list-style-type: none"> <li>Regularly review and align CHIRP's development with evolving SSC S6 and industry needs and best practices.</li> <li>Strengthen the value proposition and engagement structure so external partners are motivated to support CHIRP.</li> </ul>

## E.4 Planned Remediation Objectives and Coordinated Partner Actions

This table outlines CHIRP's key remedial objectives and the concrete actions required from both internal teams and external partners to achieve them. It links each goal, ranging from tighter partner alignment and stable SOW management to clearer collaboration frameworks, structured dispute resolution, proactive clearance planning, and stronger industry engagement, with specific internal process improvements and corresponding expectations for academic and industry collaborators. Taken together, these actions are intended to create more predictable, accountable, and strategically aligned partnerships that support CHIRP's evolving program needs.

Table 12 Remediation Objectives

Objective	Internal Actions	External Actions
Ensure future partner selection and contracts are tightly aligned with CHIRP's needs.	<ul style="list-style-type: none"> <li>Define detailed partner selection criteria: technical capabilities, domain expertise, responsiveness, prior performance.</li> <li>Create a standardized partner evaluation process (Request for Information (RFI), Request for Proposal (RFP) templates, scoring rubrics).</li> <li>Involve technical leads, program managers, and legal early in partner selection.</li> </ul>	<ul style="list-style-type: none"> <li>Provide clear capability statements and examples of similar work.</li> <li>Agree to measurable performance metrics in contracts.</li> <li>Commit to periodic alignment meetings to review fit and progress.</li> </ul>

<p>Maintain a clear yet flexible SOW with controlled change processes.</p>	<ul style="list-style-type: none"> <li>• Establish a formal change control process for the SOW (who can propose changes, how they're approved, how often).</li> <li>• Implement SOW review checkpoints (e.g., quarterly) to confirm scope, deliverables, and timelines.</li> <li>• Maintain a single, version-controlled SOW repository with clear change logs.</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in scheduled SOW review sessions and provide impact assessments for proposed changes.</li> <li>• Document dependencies and constraints that affect ability to accept scope changes.</li> <li>• Provide updated work plans when scope changes are approved.</li> </ul>
<p>Create clear, flexible collaboration frameworks to guide multi-party work.</p>	<ul style="list-style-type: none"> <li>• Draft collaboration guidelines covering roles/responsibilities, communication cadence, decision rights, documentation standards.</li> <li>• Establish a governance structure (steering committee, technical working groups, escalation paths).</li> <li>• Defining required coordination artifacts (e.g., meeting notes, action item trackers, decision logs).</li> </ul>	<ul style="list-style-type: none"> <li>• Nominate points of contact for governance bodies and decision-making.</li> <li>• Commit to participation in governance meetings and timely responses to action items.</li> <li>• Align internal processes to the agreed collaboration framework.</li> </ul>
<p>Introduce clear, formal pathways to manage disagreements and prevent disruptions.</p>	<ul style="list-style-type: none"> <li>• Work with legal/contracting to introduce dispute resolution clauses into new and modified agreements (e.g., escalation steps, mediation timelines).</li> <li>• Define internal escalation tiers (project level → program level → executive sponsor).</li> <li>• Providing guidance/training to project leads on when and how to activate dispute resolution mechanisms.</li> </ul>	<ul style="list-style-type: none"> <li>• Agree to structured dispute resolution pathways in contracts/MOUs.</li> <li>• Designate a representative empowered to engage in resolution discussions.</li> <li>• Commit to timely participation in mediation or facilitated sessions when invoked.</li> </ul>

<p>De-risk schedule by proactively managing clearance and review processes.</p>	<ul style="list-style-type: none"> <li>• Map out the full clearance pathway: all reviewers, required documentation, typical durations.</li> <li>• Integrate clearance milestones into the project plan with realistic lead times.</li> <li>• Create templates/checklists to reduce rejection or rework in submissions</li> </ul>	<ul style="list-style-type: none"> <li>• Provide required documentation early and in standardized formats.</li> <li>• Identify any additional institutional or regulatory approvals required on their side.</li> <li>• Communicate anticipated delays or constraints in advance.</li> </ul>
<p>Strengthen and systematize industry relationships to keep CHIRP relevant and well-supported.</p>	<ul style="list-style-type: none"> <li>• Develop an industry engagement strategy (target sectors, key partners, engagement formats).</li> <li>• Schedule regular touchpoints (e.g., quarterly industry roundtables or advisory boards).</li> <li>• Create concise materials that clearly articulate CHIRP's value proposition and roadmap.</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in advisory sessions and share feedback on requirements and use cases.</li> <li>• Provide insight into integration, scalability, and commercialization considerations.</li> <li>• Explore pilot projects or joint development efforts aligned with CHIRP.</li> </ul>



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