

Student Opportunities at UCAR

UNIVERSITY CORPORATION FOR ATMOSPHERIC RESEARCH

Bill Kuo

Director, UCAR Community Programs



UCAR – SCIENCE AMPLIFIER & MULTIPLIER

- **Nonprofit** founded in 1960 by 14 universities
- **Manages NCAR** on behalf of NSF and the university community
- **Offers Community Programs** in response to requests (UCP)
- **Serves as a hub** for community discussion and action
- **Provides national leadership** across academia, government labs, private sector





131 Members
October 2024

OUR COMBINED STRENGTH

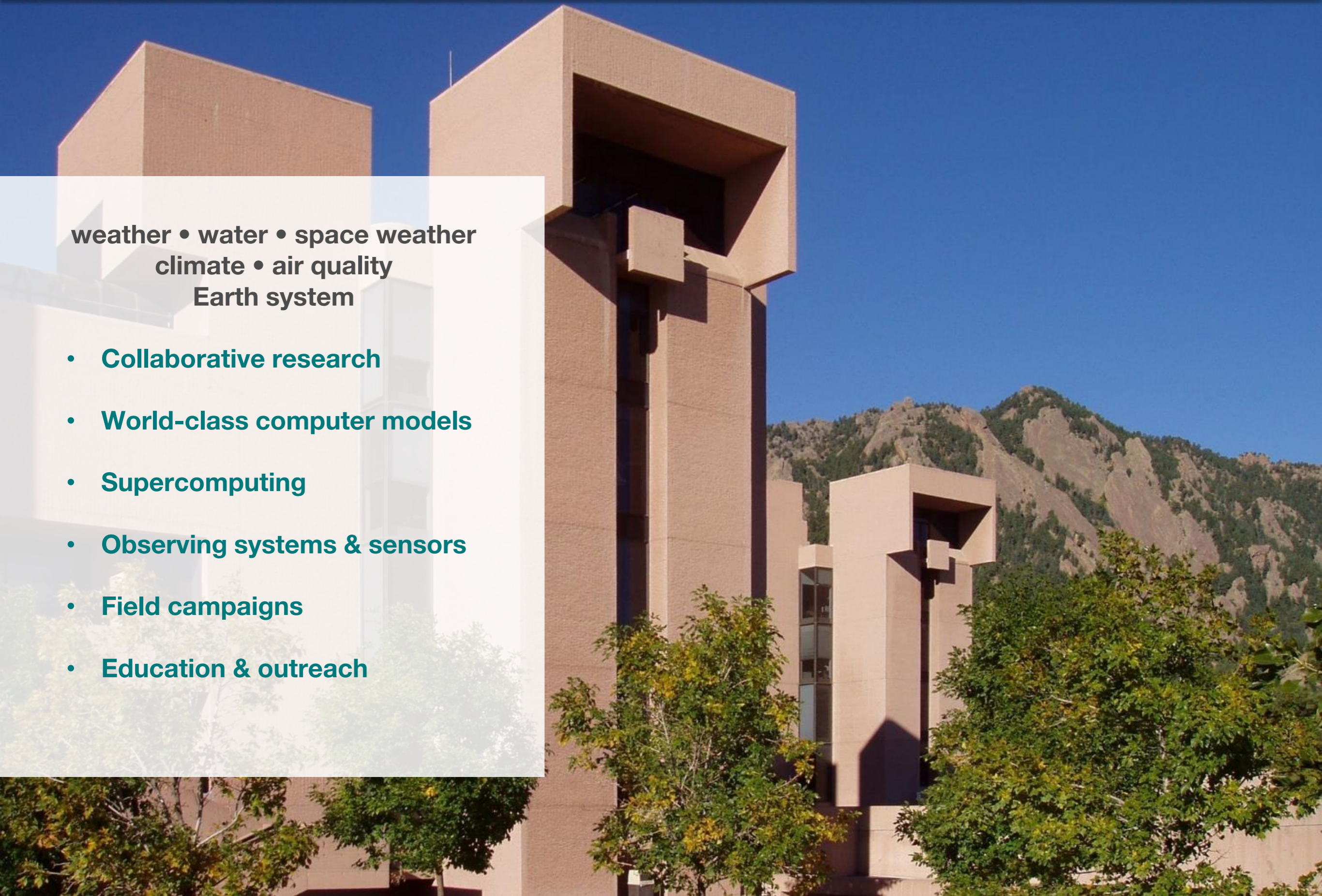
- **A national touchstone** for research, education, and advanced technology development
- **Budget:** ~\$235 million
- **Staff:** ~1,400
- **Locations:**
 - Colorado
 - Wyoming
 - Hawaii
 - Washington, D.C.



NCAR – RESEARCH, FACILITIES & SERVICES

weather • water • space weather
climate • air quality
Earth system

- Collaborative research
- World-class computer models
- Supercomputing
- Observing systems & sensors
- Field campaigns
- Education & outreach



LABS AND PROGRAMS IN BRIEF



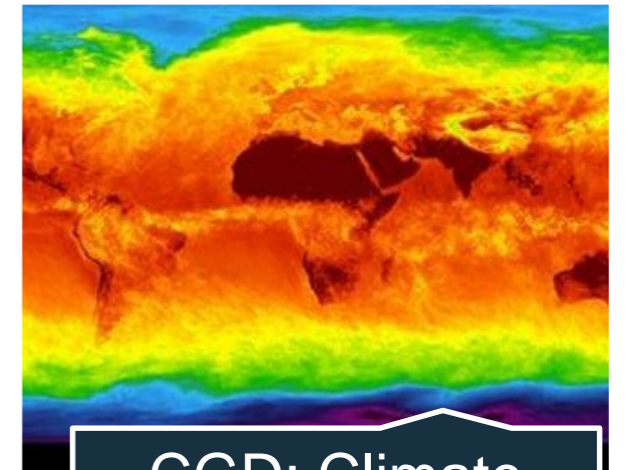
ACOM: Air quality



HAO: Space weather



MMM: Weather



CGD: Climate change



CISL: Supercomputing



EOL: Observations



RAL: Research to operations



EdEC: Developing early career scientists

UCAR's COMMUNITY PROGRAMS

- **Education & Training**

K-12 students & teachers
Undergrads & grad students
Professional geoscientists
Courses & workshops
Online, self-paced

- **Earth Observations & Data Services**

Geoscience data, plus analysis tools
COSMIC satellite data

- **Scientific Partnership & Services**

Events management
Workforce management
Long-term partnerships

- **Research to Operations**

Transitioning research advances into operations

UCAR COMMUNITY PROGRAMS (UCP)

UCP is organized into four centers that house the programs related to the mission of that center. The centers and their corresponding programs are:

Earth Observation and Data Services (EODS)

- University Data for Research and Education (Unidata)
- **Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC)**
- Joint Center for Satellite Data Assimilation (JCSDA)

Education and Training (ETC)

- Global Learning and Observations to Benefit the Environment (GLOBE)
- UCAR Center for Science Education (SciEd)
- Cooperative Program for Operational Meteorology Education and Training (COMET)

Scientific Partnerships and Services (SPS)

- Cooperative Programs for the Advancement of Earth System Science (CPAESS)

Center for Ocean Leadership (COL)

RESEARCH CAPABILITIES



- **NCAR-Wyoming Supercomputing Center (NWSC)**
- **Aircraft, satellites, and sensors**
- **Community-led computer models** (climate, weather, chemical, solar)
- **Mauna Loa Solar Observatory** (Hawaii)
- **NCAR Library & Archives** (3 campus locations & online)

NCAR Opportunities



Scott Landolt

**Advanced Study Program Science
Advisor & Co-lead “Future workforce”
Project Scientist - Research
Applications Laboratory**

Contact: landolt@ucar.edu



Jerry Cycone

**NCAR Student Program
Coordinator**

Contact: cyccone@ucar.edu



Soudeh Kamali

**Co-lead “Future workforce”
Project Scientist - High Altitude
Observatory**

Contact: skamali@ucar.edu

Opportunities at NCAR – making a difference with geosciences

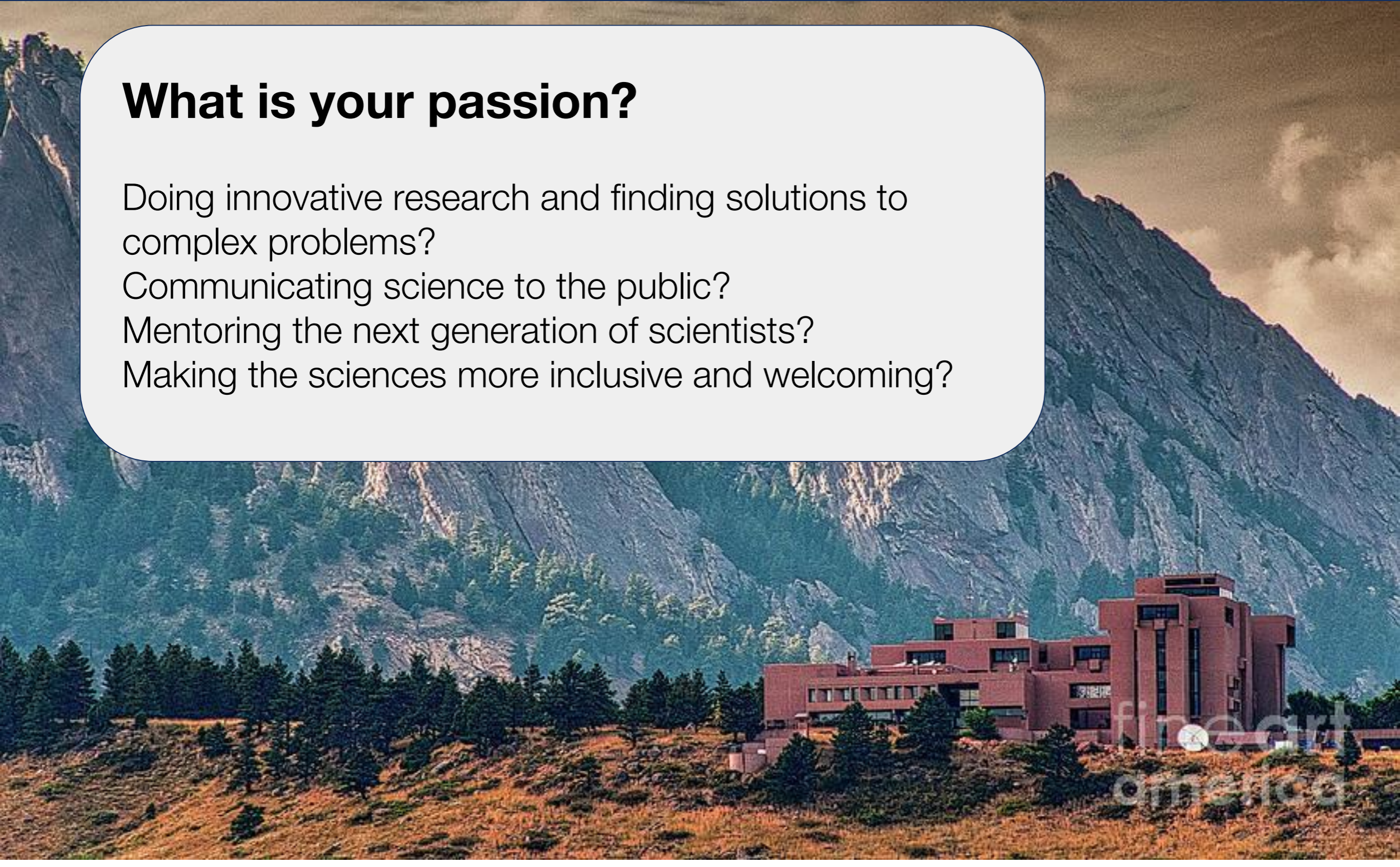
What is your passion?

Doing innovative research and finding solutions to complex problems?

Communicating science to the public?

Mentoring the next generation of scientists?

Making the sciences more inclusive and welcoming?



MENTORING, PROFESSIONAL DEVELOPMENT, AND COHORT
BUILDING

BEING AN INTERN AT NCAR



NCAR hosts a wide range of undergraduate internships every summer including:

- SIParCS
- HAO BOLD & REU
- EOL SUPER
- NESSI
- ACOM
- Unidata
- UCAR|SOARS®

All programs run May - August, cover a salary, housing & travel (when in Boulder), and in some cases a trip to a national conference.

All interns take part in weekly professional development workshops during the summer and also a poster symposium at the end of the summer.



Check out opportunities at <https://edec.ucar.edu/students>

Undergraduate Leadership Workshop

This **five-day immersion experience at NCAR** in Boulder, Colorado, gives undergraduate students a chance to explore careers in the atmospheric sciences and develop their leadership potential.



The leadership components of the workshop involve **team building and leadership training, networking, and developing communication skills.** Areas of scientific focus include weather research, forecasting, climate modeling, solar dynamics, and societal impacts of severe weather and climate change.

<https://edec.ucar.edu/students/undergraduate-leadership-workshop>

ASP Graduate Visitor Program and GVP Bridge

The **ASP Graduate Visitor Program** is designed for graduate students to work on parts of their thesis, or equivalent final project, with guidance from NCAR scientists and engineers. Visits last 2 to 12 months. Each year we sponsor ~25 students.

Application Deadline: November 1, 2024

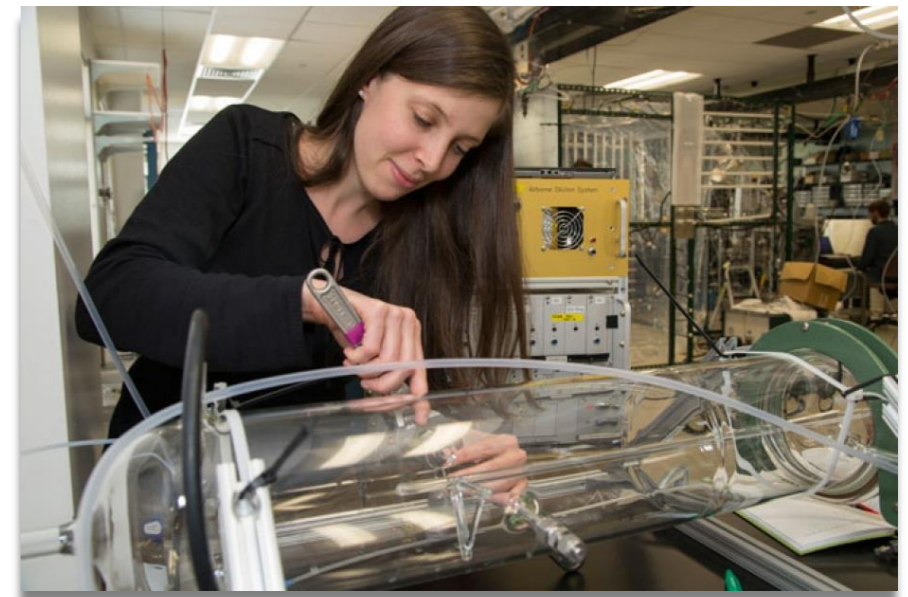
Nomination Deadline: November 6, 2024

<https://edec.ucar.edu/advanced-study-program/graduate-visitor-program>



ASP Postdoctoral Fellowship

The postdoctoral fellowship program, part of the [Advanced Study Program \(ASP\)](#), provides an opportunity for recent Ph.D. scientists from many geoscience and related disciplines to pursue their research interests in atmospheric and related science. Postdocs are part of a welcoming and inclusive community and have access to an extensive professional development program. **Deadline: Nov. 3, 2024**



*****NCAR also offers project-specific postdoctoral opportunities posted in our job listings as they become available*****

CPAESS Student Opportunities



Hanne Mauriello

Director, CPAESS

Director, Scientific Partnerships and
Services Center (SPS)



Cindy Bruyère

Deputy Director, CPAESS

Deputy Director, Scientific Partnerships and
Services Center (SPS)

CPAESS Managed Internships

NOAA Explorers-In-Training Internship

CPAESS works with NOAA's Office of Ocean Exploration to manage two internships each summer. **The Explorer-in-Training Program** provides meaningful experiential learning opportunities through two internship options:

- **Hydrography & Seafloor Mapping** (Offshore, expedition-based, 2-4 week internship): Mapping the seafloor via NOAA Ship *Okeanos Explorer* is an integral part of NOAA Ocean Exploration's mission, providing critical bathymetric data needed to characterize previously unexplored areas.
- **Exploration Education, Media, & Science Communication** (Shore-based, 10-week Summer internship): Interns will work on cross-disciplinary projects to gain experience in scientific communication, ocean education programming, and media use.

Applications will be accepted soon, with a deadline in December or January.



For more information cpaess.ucar.edu/explorer-in-training-program

CPAESS Dissertation Fellowship Program

The NOAA Weather Program Office (WPO) Innovation for Next Generation Scientists (WINGS) Dissertation Fellowship Program

CPAESS manages the WINGS Dissertation Fellowship. Fellows are UCAR employees and receive a fixed annual salary plus UCAR's employment benefits.

This fellowship is designed for Ph.D. candidates to work with both their academic advisor and a NOAA Weather Program Office mentor when they have completed their Ph.D. coursework and are in the process of writing their dissertations. **This program adds real-world experience to the doctoral process and enable the student to gain insight into the application of their field with NOAA scientists.**

Currently accepting applications

Deadline for applications - January 31, 2025

Must start Ph.D. Candidacy and Fellowship by December 8, 2025



For more information

<https://cpaess.ucar.edu/wings>

CPAESS Postdoctoral Fellowship Program

NOAA Climate & Global Change Postdoctoral Fellowship Program

CPAESS manages the NOAA Climate and Global Change Postdoctoral Program on behalf of the NOAA Climate Program Office. Fellows are UCAR employees and receive a fixed annual salary plus UCAR's employment benefits.

The purpose of the program is to help create and train the next generation of leading researchers needed for climate studies. The program focuses on observing, understanding, modeling, and predicting climate variability and change on seasonal and longer time scales. This includes the documentation and analysis of past, current, or possible future climate variability and change as well as the study of the underlying **physical, chemical, and biological** processes.

Currently accepting applications

Deadline for applications - January 10, 2025

Must start Fellowship by December 8, 2025



*Vasilii Petrenko, Class 18 & Christo
Buizert, Class 22*

For more information

cpaess.ucar.edu/cgc

CPAESS Education and Networking Opportunity

NASA Heliophysics Summer School Program

*Students working on Heliophysics Lab
Exercise in Summer 2019*



CPAESS manages the NASA Heliophysics Summer School Program. This program consists of two separate components. The first is a virtual week of training, labs, lectures, and brainstorming sessions with staff and fellow students. The second part is a week in-person session with similar activities and a tour of NCAR's High Altitude Observatory in Boulder, Colorado.

The Heliophysics Summer School focuses on the physics of space weather events that start at the Sun and influence atmospheres, ionospheres and magnetospheres throughout the solar system. It is highly interdisciplinary in nature.

Applications will be accepted soon. Summer School will take place Jul/Aug 2025. Check the website for details coming soon!

For more information

heliophysics.ucar.edu/summer-school

NSF SOARS®: 28 Years' Exemplar for Science Research and Mentoring Program

NSF SOARS is a multi-year undergraduate-to-graduate bridge program that focuses on increasing the diversity of the atmospheric and related sciences, and in expanding career pathways. Spanning its 28+ year history, as of 2024 of the 267 Protégés from historically marginalized groups in STEM who have participated in the program:

- **88** are currently enrolled in Bachelor's, Master's, and Doctoral degree programs;
- **255** Bachelor's degrees have been completed;
- **135** Alumni have completed Master's-level advanced degrees.
- **54** Alumni have earned the Doctoral degree; and
- **53** more are currently in PhD programs. Many Alumni have multiple degrees at all levels.



**2024 NSF SOARS
Cohort**

NSF SOARS®: 28 Year Exemplar for Science Research and Mentoring Program

The core pillars that created NSF SOARS still exist today. These include research, mentoring, and community.



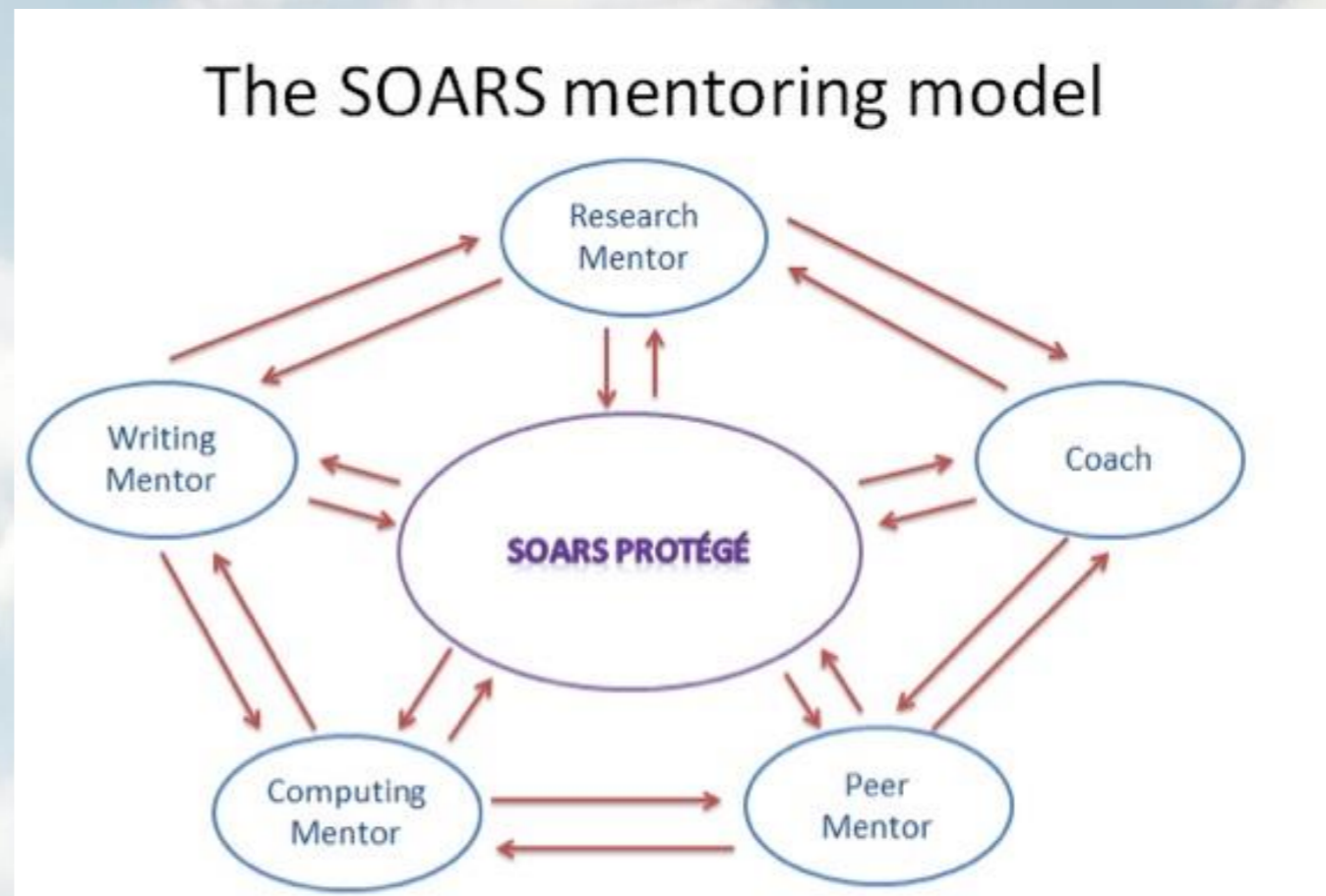
Inaugural NSF SOARS Cohort in 1996

Mentoring in NSF SOARS

Mentors are the heart ♥ of NSF SOARS!

They provide:

- Scientific, communication, and computing guidance
- Confidence building
- Introductions and networking
- Ethics and professional behavior
- role-modeling
- Collaborations
- Insight into life as a scientist
- Career guidance
- A sense of belonging



Adapted from Thomas L. Windham, Amy J. Stevermer, and Richard A. Anthes, 2004: SOARS®: An Overview of the Program and Its First 8 Years. *Bull. Amer. Meteor. Soc.*, **85**, 42–47

NSF SOARS received the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring in 2001

NSF SOARS received the 2019 *Diversity & Inclusion Program of the Year* award by the US 2020 Makers + Mentors organization.

Mentoring in NSF SOARS

The **Research/Science Mentor** and Protégé collaborate to create a research plan and work together to monitor progress and interpret results as the project progresses. Usually the Protégé's project is in the science mentor's lab.

The **Writing/Communication Mentor** offers one-on-one feedback to her/his Protégé on written products, PowerPoint presentations and posters. The SCW Instructor is available to support writing mentors throughout the summer.

The **Computing Mentor** supports the Protégé in learning and applying the computing skills necessary to complete their research objectives. The CDW Instructor is available to support computing mentors throughout the summer.

The **Coach** helps new Protégés develop solutions to troubling situations by helping them define the problem, envision the way they would like things to be, and develop and implement steps to get there; as well as checking in on the Protégés.

Peer Mentors are returning Protégés who provide support to new Protégés and help them integrate into the NSF SOARS community.

Applications for the 2025 NSF SOARS Cohort are now open

Applications for the 2025 Cohort are due on **January 21, 2025.**

Please contact soars@ucar.edu with any questions!



ELIGIBILITY REQUIREMENTS:

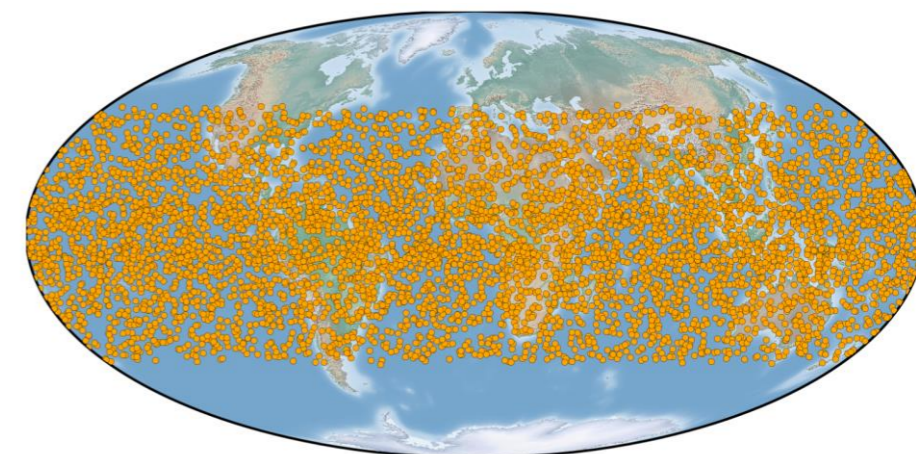
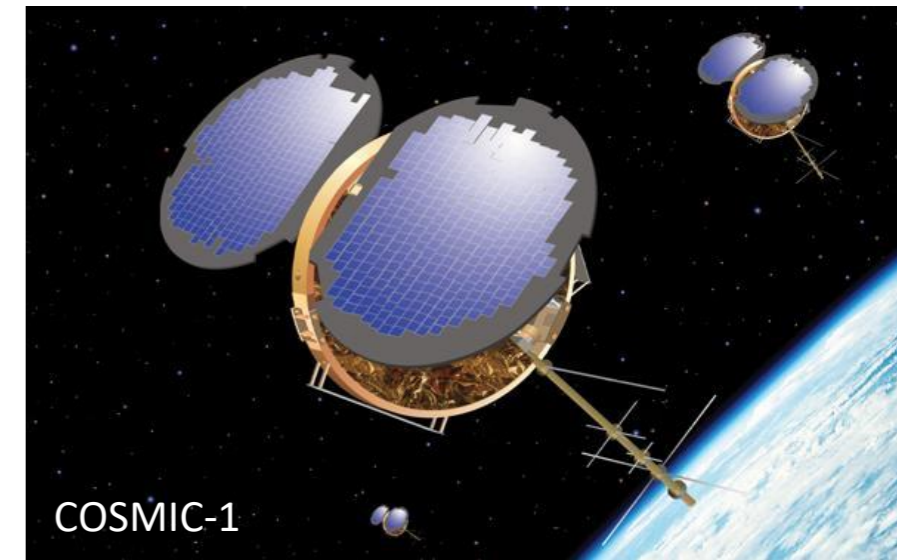
- Must be enrolled in a degree-granting institution
- Must not have received a Bachelor's degree
- Must be a U.S. Citizen or Permanent Resident



COSMIC Program



- UCAR's Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC) Program provides innovative and cost-effective remote sensing observations, data products, and data utilization support, focusing primarily on Global Navigation Satellite Systems (GNSS), to benefit scientific research, research to operations, operations, and education and training in the atmospheric and related sciences.
- COSMIC has been a leader in the retrieval and scientific applications of GNSS remote sensing since UCAR led the GPS/MET GPS radio occultation (RO) mission in the mid 1990s. It contributed to the design, management, and operation of the FORMOSAT-3/[COSMIC-1](#) mission from 2006 to 2020. In 2019, a follow on mission, FORMOSAT-7/[COSMIC-2](#), launched and is providing high quality and impactful neutral atmosphere and space weather products for operations and science.
- COSMIC consists of approximately 30 scientists, engineers, software engineers, IT, and support staff, with expertise in ground and space GNSS measurements and data processing, radio occultation, reflections, spacecraft integration/testing, atmospheric, space weather, and climate science.



COSMIC-2 One Day RO Coverage

<https://cosmic.ucar.edu>

- The COSMIC Program, supported by NSF and NASA, is continuing a postdoctoral fellowship program to support and encourage the advancement and application of Global Navigation Satellite System (GNSS) remote sensing for Earth science.
- The fellowship program is designed to support early career scientists who are interested in GNSS remote sensing and would like to begin their career working within a group of scientists with research interests in measurements, retrieval technology, space weather, numerical weather prediction, and climate processes.
- Areas of research may include, but are not limited to:
 - Evaluation of the accuracy and precision of RO observations, numerical weather prediction and data assimilation, climate, ionosphere, water cycle, improved retrieval development, and other GNSS research opportunities, such as GNSS reflectometry.
- Elements of application:
 - Statement of research, CV, transcripts, references
- We expect to open the next opportunity for applications in 2025. Please check this site to apply:

https://ucar.wd5.myworkdayjobs.com/UCAR_Career

NCAR|UCAR|UCP

Internships - Workshops - Visitor Programs

Undergraduate Programs

10-week summer programs

- SIParCS
- HAO BOLD
- EOL SUPER
- Unidata
- NESSI
- ACOM
- UCAR|SOARS
- Undergraduate Leadership Workshop (ULW) - one week intensive workshop

Graduate Programs

Vary from week-long workshops to months-long visits

- ASP Graduate Visitor Program (GVP) and GVP Bridge
- ASP Colloquium
- CESM Workshop
- WRF Tutorial
- MPAS Tutorial
- BRIGHTE Workshop
- NextGen Fellowships
- Postdoctoral Opportunities

https://www.ucar.edu/exhibit/students_postdocs

Research and Education Opportunities for Students

NCAR and UCP offer many research and education opportunities for students, including undergraduate internships, graduate and postdoctoral fellowships:

NCAR

student opportunities: <https://edec.ucar.edu/students>

postdoc opportunities: <https://edec.ucar.edu/postdocs>

UCP

internship opportunities: <https://www.ucar.edu/opportunities/internships>

postdoc opportunities offered by CPAESS: <https://cpaess.ucar.edu/opportunities>

student opportunities offered by Unidata: <https://www.unidata.ucar.edu/internship/>

small research grants offered by COMET: <https://www.comet.ucar.edu/outreach/>

UCAR

job opportunities: https://ucar.wd5.myworkdayjobs.com/UCAR_Careers

Next-generation fellowship: <https://www.ucar.edu/opportunities/fellowships/ucar-next-generation-fellowships>