



Cosmic Horizons 2 - Welcome!

Stella Offner, July 14

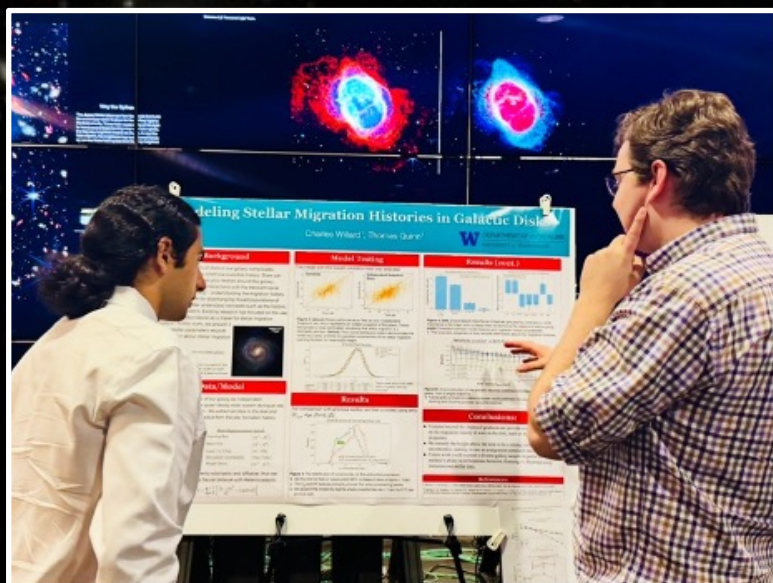
UT Austin, Director of NSF-Simons AI Institute for Cosmic Origins (CosmicAI)



Why we're here!



Cosmic Horizons
Conference I (UT)



Building a community, tackling challenges & seizing opportunities



Advance research at the intersection of AI and Astronomy towards understanding our cosmic origins, from cosmology to habitability.



Increase the trustworthiness, robustness, interpretability, and efficiency of AI methods & applications in astronomy.



Prepare for the big-data challenges posed by next-generation observing facilities and high-dimensional data.



Confront the rapid evolution of generative AI in research, from ideation, to analysis, to writing.



CosmicAI is one of 29 NSF-Funded AI Institutes



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National Artificial Intelligence Research Institutes

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NATIONAL AI RESEARCH INSTITUTES

The NSF-led National AI Research Institutes Program is the nation's largest AI research ecosystem and is supported by a partnership of federal agencies and industry leaders.

★ LEAD ORGANIZATION ○ SUBAWARDS



Vision: A future in which astronomy research
& discovery is powered by **trustworthy,**
robust, efficient and **interpretable** AI.

Vision: A future in which astronomy research & discovery is powered by **trustworthy, robust, efficient and interpretable AI.**

AI is a **partner** in all aspects of the research cycle.

Projects that previously required weeks or months can be **completed in hours or days.**

CosmicAI Mission

CosmicAI aims to develop transformative AI methods to meet pressing Astronomical challenges and tackle outstanding questions about our cosmic origins through research in four fundamental AI themes: trustworthiness, efficiency, interpretability, and robustness.



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CosmicAI will serve as a nexus of collaboration to increase the accessibility of astronomy and AI data and methods through open-source AI-powered tools, data sharing, and AI educational initiatives.



Research Themes

Artificial Intelligence | Astronomy



Explorable Universe

Advance generative
AI **trustworthiness**
by developing open
AI foundation models
for astronomy

Observable Universe

Develop **efficient** AI
techniques to expedite
observing pipelines and
discovery in big
datasets

Accelerated Universe

Develop fast **robust** AI
surrogates to model
multi-physics,
multi-scale astrophysical
systems

Explainable Universe

Extend **interpretable**
AI methods and apply
causal reasoning to
analyze large-scale
simulations

Who we are: Nexus of Collaboration

★ Lead Institutions

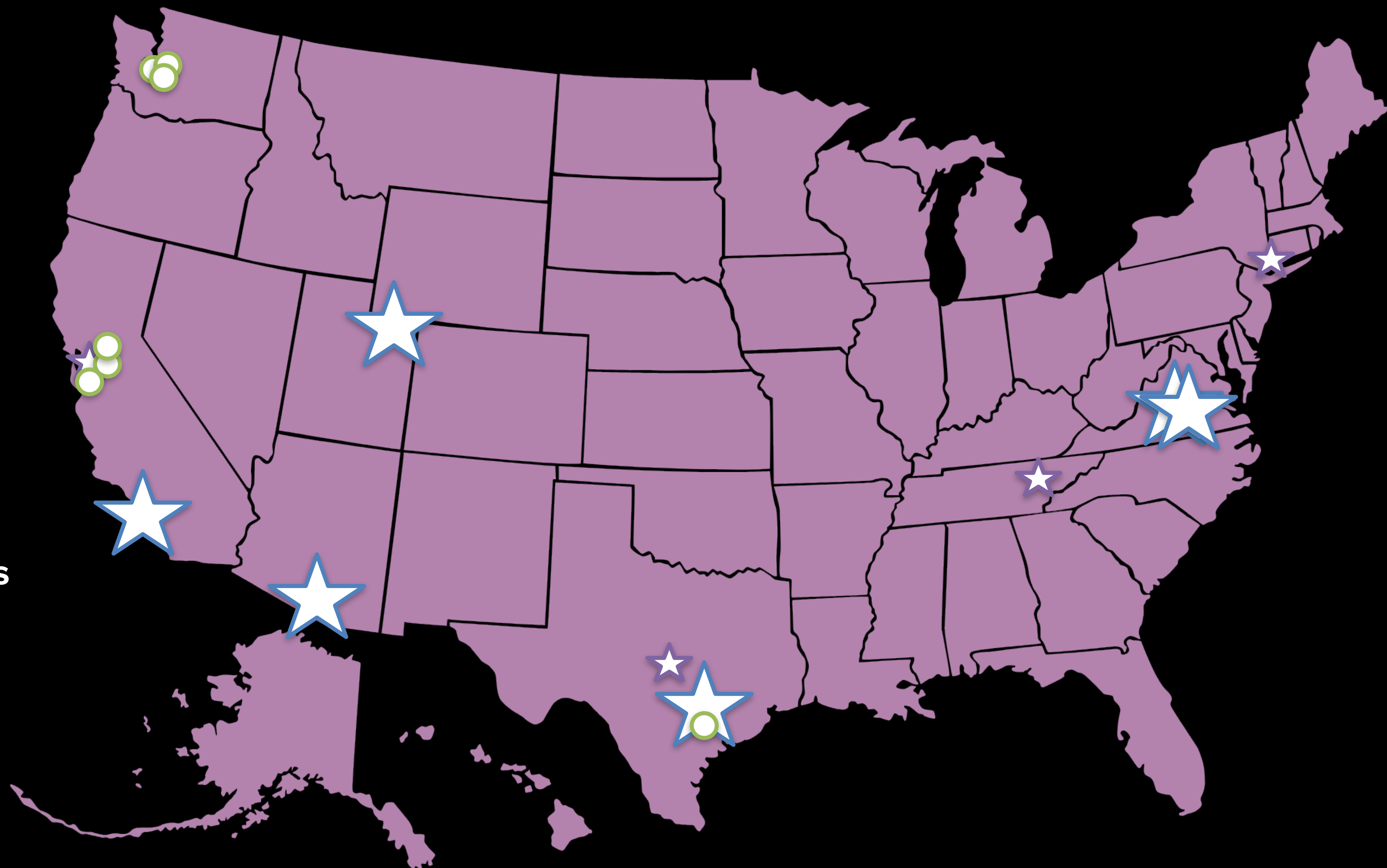
- University of Texas at Austin
- University of Virginia
- University of Utah
- University of California Los Angeles
- National Radio Astronomy Observatory
- National Optical-Infrared Astronomy Research Laboratory

★ Academic Partners & Labs

- SLAC National Accelerator Laboratory
- University of Texas Arlington
- University of Tennessee
- New York University

● Industry/Non-Profit Partners

- Ai2
- Microsoft
- Intel
- NVIDIA
- Sony AI
- Amazon
- SparkCognition



Executive Leadership

Operations



Stella Offner
UT Austin
PI and Director
Accelerated Universe,
Astro Lead



Matt Lease
UT Austin
Co-Director
Explorable Universe,
AI Lead



Pratik Mhatre
Managing Director.
UT Austin



Jane Cortez
Communications
Director



Niall Gaffney (TACC)
Computing Director,
Data Platform Lead

Research Group Leads

Explorable Universe



Stéphanie Juneau
NOIRLab
Explorable Universe,
Astro Lead,
Data Platform lead



Jessy Li
UT Austin
Explorable Universe,
AI Lead

Explainable Universe



Paul Torrey
University of Virginia
Explainable Universe,
Astro Lead



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UT-Austin
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Explainable Universe,
AI Lead

Data Platform



Adam Bolton
SLAC Stanford
Data Platform lead

Observable Universe



Jeff Phillips
University of Utah
Observable Universe,
AI Lead



Eric Murphy
NRAO
Co-PI
Observable Universe,
Astro Lead

Accelerated Universe



George Biros
UT Austin
Accelerated Universe,
AI Lead



Stella Offner
UT Austin
PI and Director
Accelerated Universe,
Astro Lead

We're here! Executive Leadership

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Research Group Leads

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Stéphanie Juneau
NOIRLab
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Data Platform lead



Jessy Li
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Astro Lead

Accelerated Universe

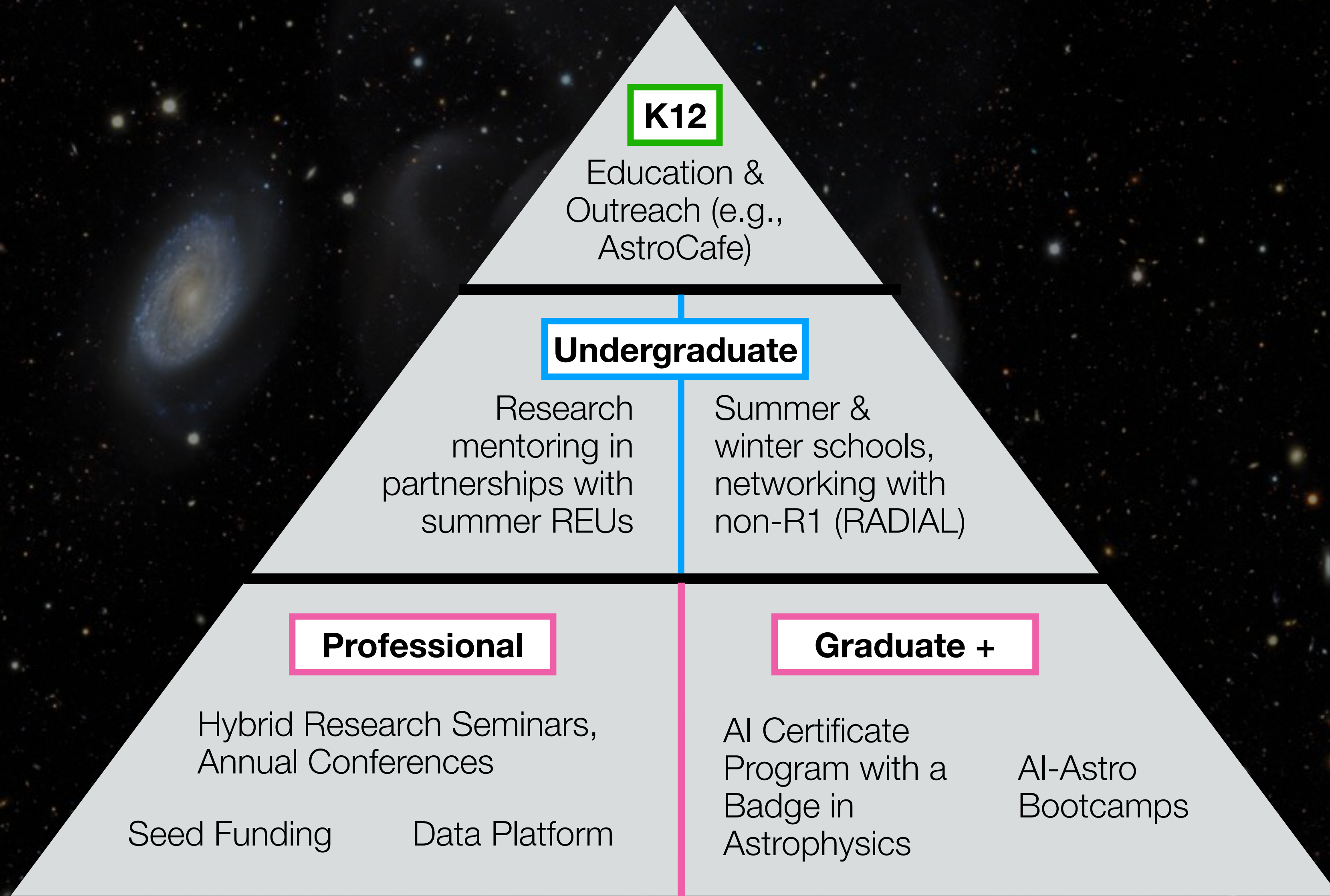


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UT Austin
Accelerated Universe,
AI Lead



Stella Offner
UT Austin
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Astro Lead

Education & Broadening Participation



Education & Broadening Participation

AI Weeklong Bootcamp



South by Southwest Festival

K12

Education & Outreach (e.g., AstroCafe)

Undergraduate

Research mentoring in partnerships with summer REUs

Summer & winter schools, networking with non-R1 (RADIAL)

Professional

Hybrid Research Seminars, Annual Conferences

Graduate +

AI Certificate Program with a Badge in Astrophysics

AI-Astro Bootcamps

Seed Funding

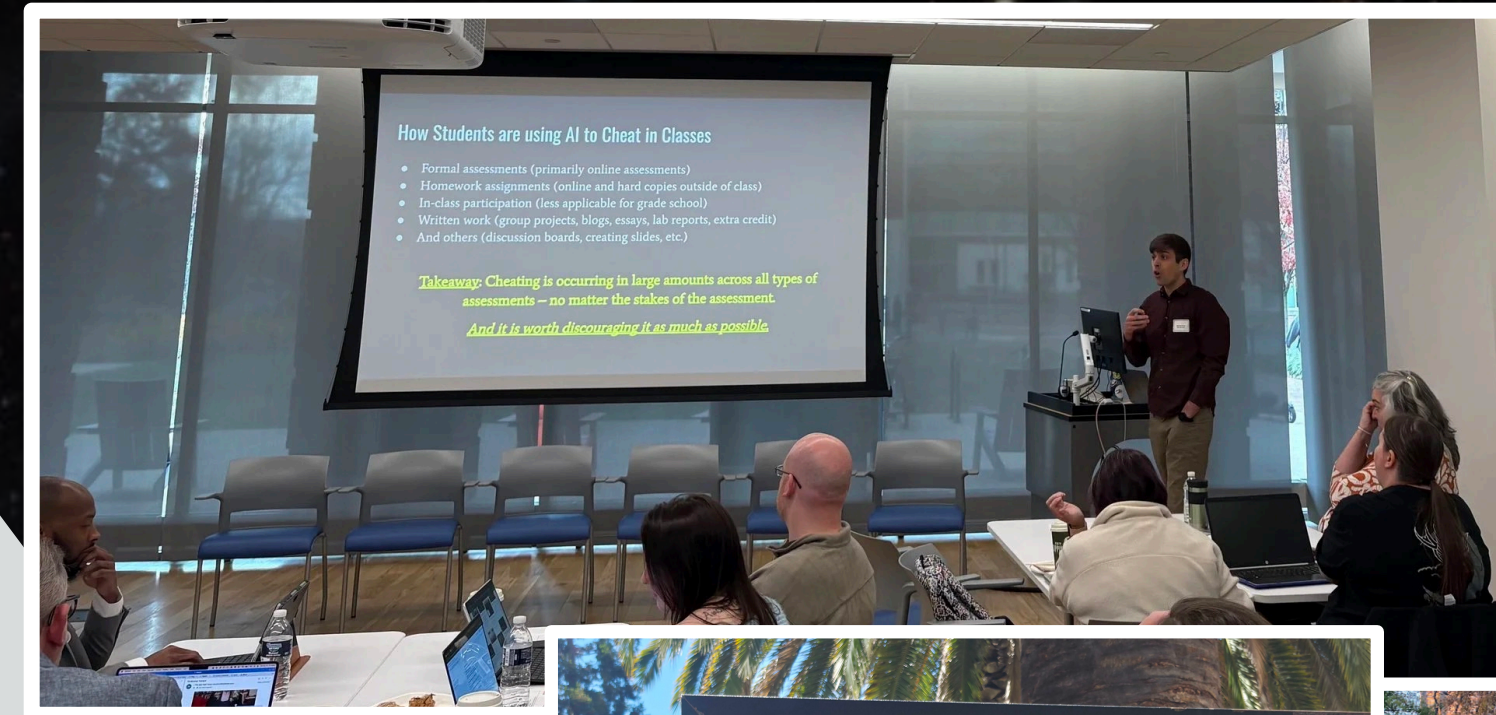
Data Platform

Education & Broadening Participation

AI Weeklong Bootcamp



AI in STEM Classrooms Teacher Training



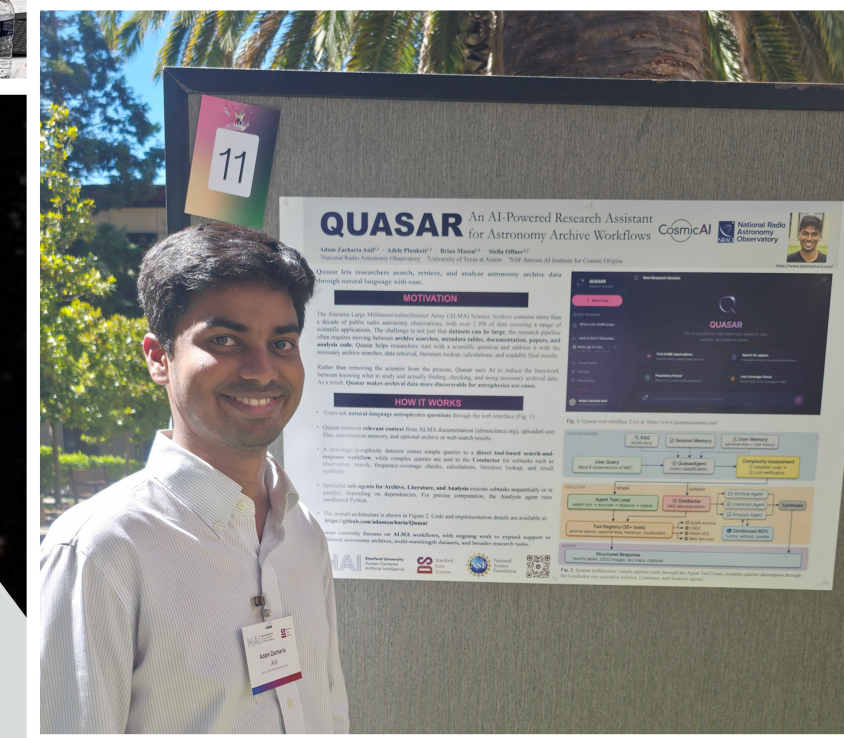
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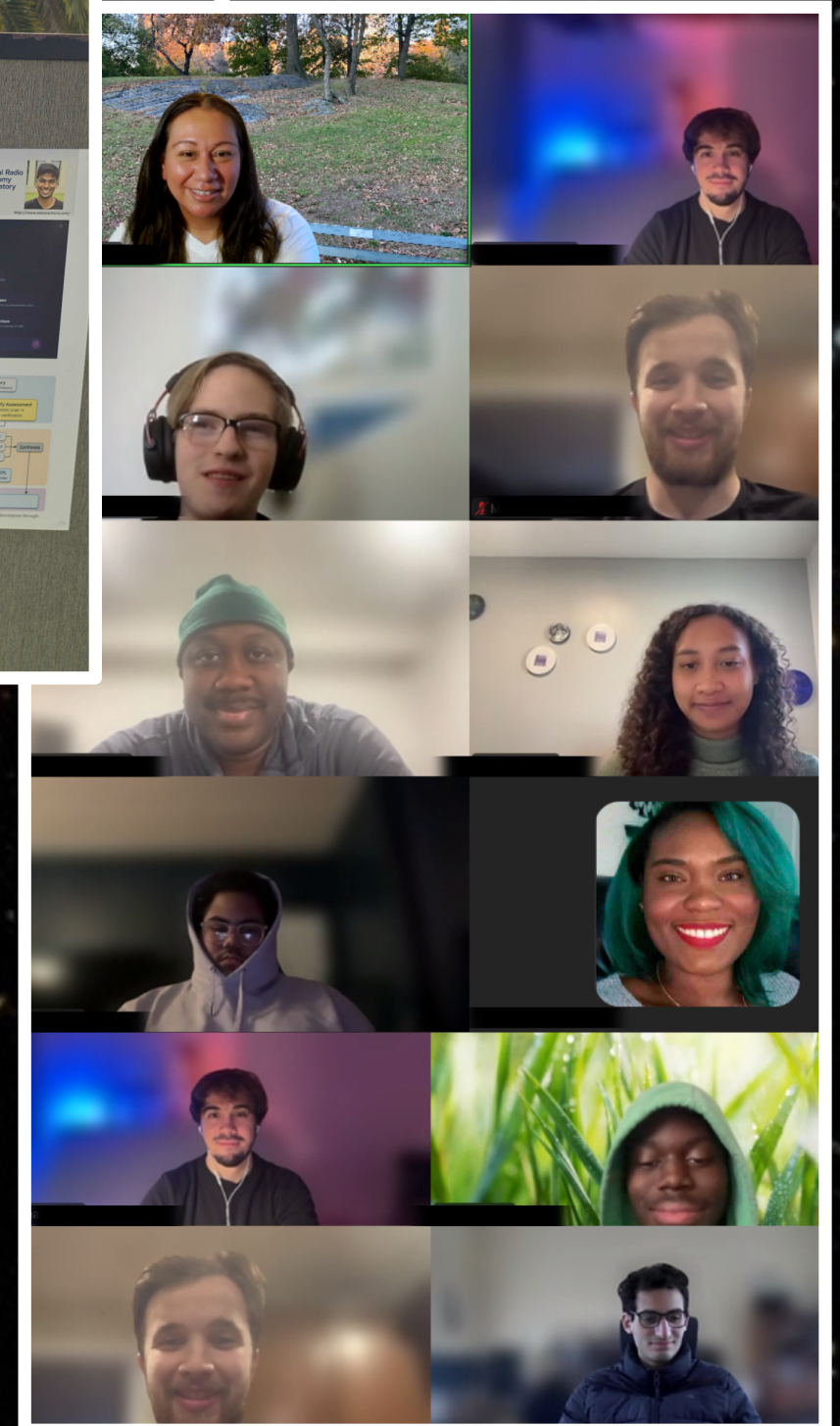
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Seed Research



Professional

Hybrid Research Seminars, Annual Conferences

Graduate +

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AI-Astro Bootcamps

Winter Research Skills School

Seed Funding

Data Platform

South by Southwest Festival

AI BOOTCAMP FOR ASTRONOMERS

PRESENTED BY THE NSF-SIMONS AI INSTITUTE FOR COSMIC ORIGINS
AND THE TEXAS ADVANCED COMPUTING CENTER

Overview of the fundamentals and theory of machine learning & deep learning techniques

Tutorials on reinforcement learning, large language models, deep learning & surrogate models

Practice applying AI techniques in a high performance computing environment

Demonstrations of public AI astronomy software packages



Location
The University of
Texas at Austin

Dates: Summer
2027 - Stay
tuned!

AI Foundations Certificate with a Badge in Astrophysics

Accredited Online Graduate Degree Program

Equips professionals with AI skills for data analysis, predictive modeling and research, fostering career advancement and long-term growth in AI-driven fields.

Advanced AI
Techniques

AI in
Astrophysics
Course

12 credit hours
4 courses

Asynchronous,
instructor-
paced

Accessed from
anywhere

Transcripted
and Accredited

Learn more

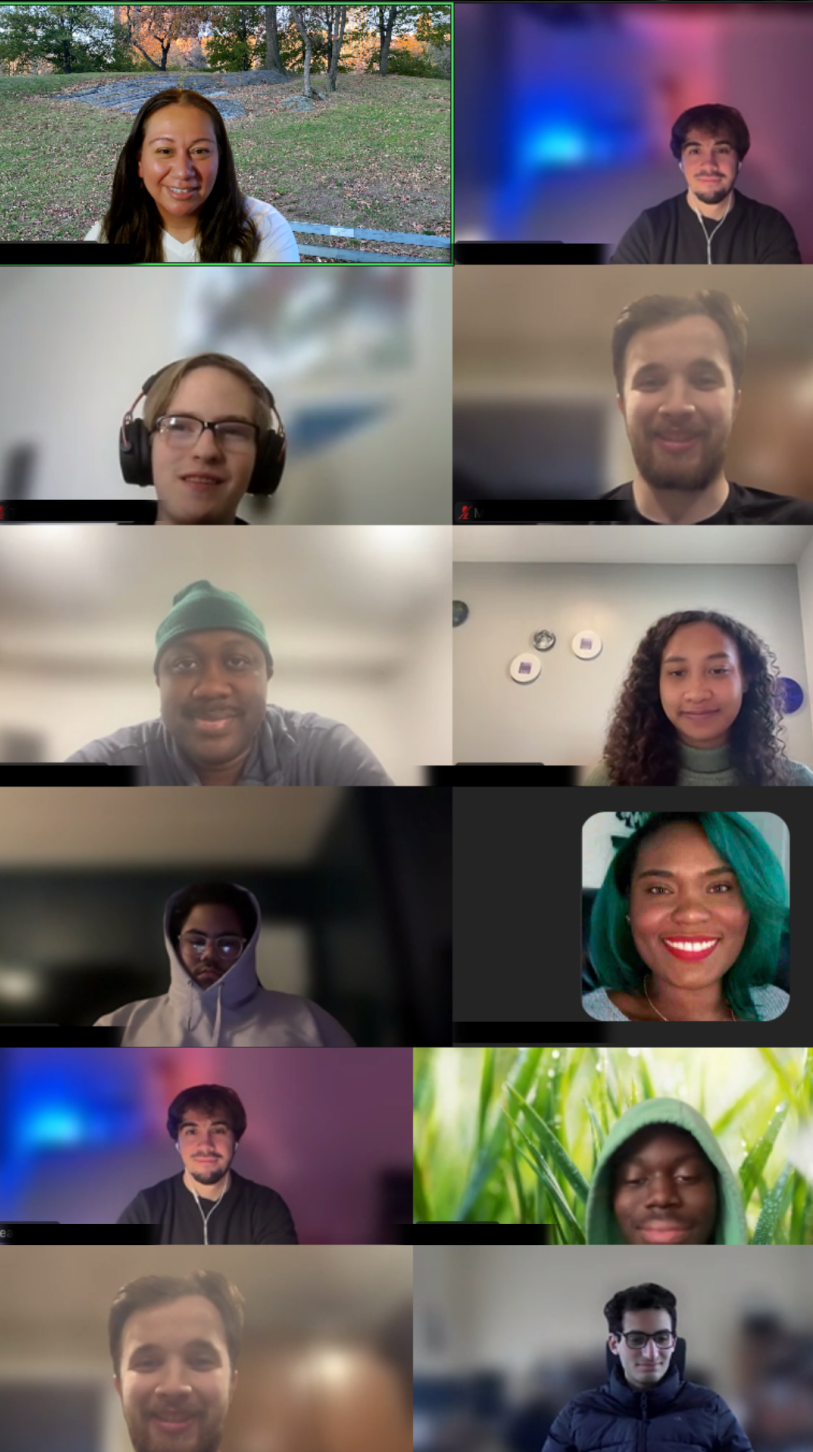


Now Accepting Applications

Applications Close : Sept 1, 2026
Program Start : Spring 2027



CosmicAI Undergrad Schools at NRAO



Winter School

40-hour online program designed to equip rising junior and senior undergraduate students with the foundational skills needed to succeed in interdisciplinary AI-Astronomy research. Prepares students for our summer school

Applications open
now through
August 31st, 2026

Program Dates:
Dec. 14 – 23, 2026
(5 hours per weekday)

Summer School

A four-week immersive, in-person experience hosted annually at NRAO Headquarters, equipping students with the tools and mentorship needed to begin research at the intersection of AI and astronomy.

Applications open
Winter 2027

Program Dates:
June/July 2027



Learn more



CosmicAI Hybrid Research Seminars

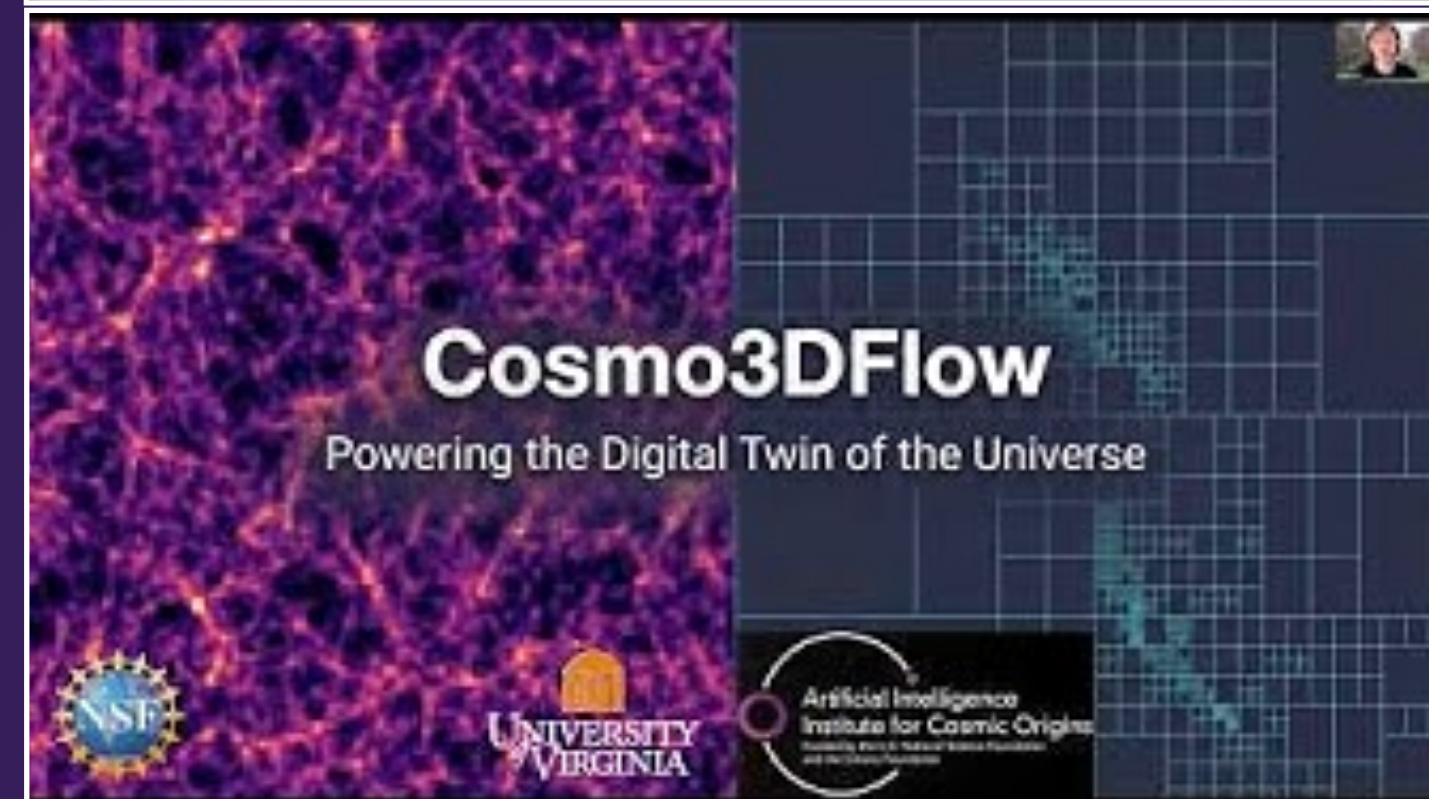
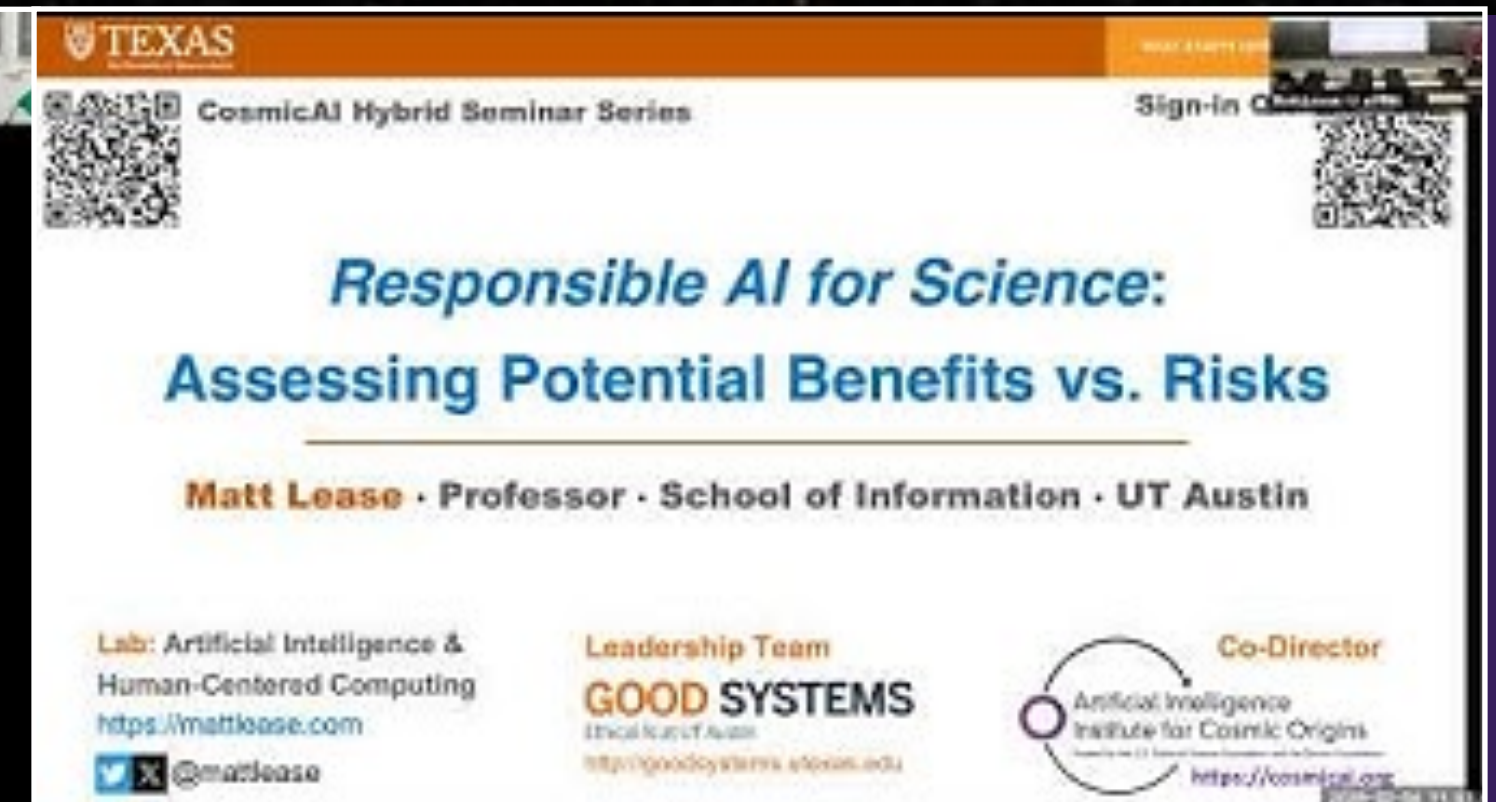
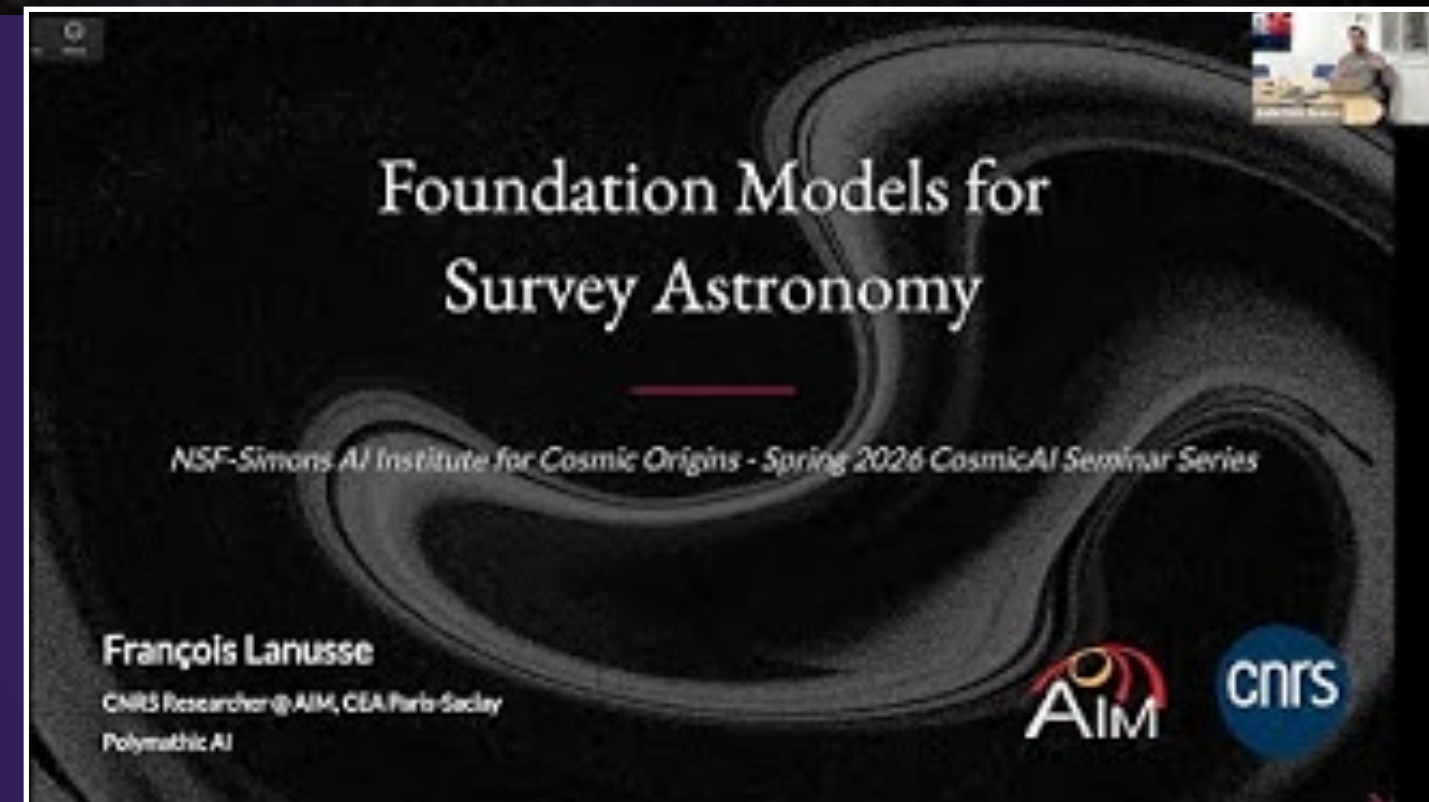
Wednesdays 1 pm Central

Start: Aug 26

Theme: Surrogate Modeling

Speakers Include

**Earl Bellinger, Omar,
Ghattas, Bei Wang,
Manuel Ballester**



**Upcoming
talks &
events**



**Visit the
seminar
archives**



Ways to Get Involved with CosmicAI

Attend

CosmicAI Seminars

Cosmic Horizon Conferences

Astro-AI Bootcamps

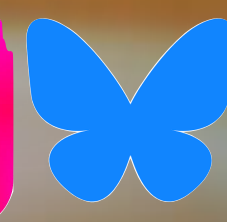
Astro-AI Grad. Certificate

Subscribe

Email

Slack

Social Media



Collaborate

Groups: Explorable
Observable
Explainable
Accelerated &
Education Initiatives

Apply

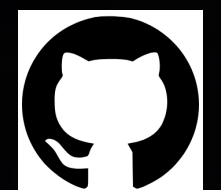
Seed funds for new
Astro-AI projects

Contribute

Data & code to our
data platform, open
source
infrastructure

Participate

Use our data,
code, models &
tools



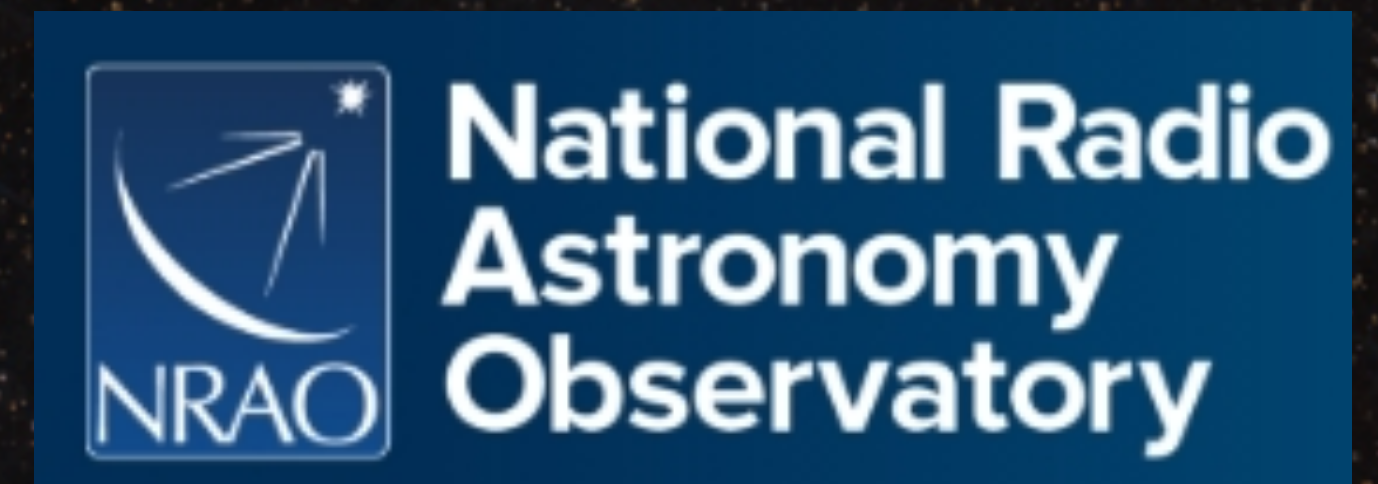
Thanks to the Conference Organizers & Sponsors

Scientific Organizing Committee:

- Arya Farahi (UT Austin), Matt Lease (UT Austin), Jessy Li (UT Austin), Ryan Loomis (NRAO), **Eric Murphy** (chair-NRAO), Stella Offner (UT Austin), El Kindi Rezig (University of Utah), Paul Torrey (UVA)

Local Organizing Committee:

- Omkar Bait (NRAO), Jane Cortez (UT Austin), Lisa Jordan (NRAO), Ryan Loomis (NRAO), Pratik Mhatre (UT Austin), Brian Mason (NRAO), Issi Marsh (NRAO), Eric Murphy (chair-NRAO), Xiaowei Ou (UVA), Paul Torrey (UVA), Ci Xue (NRAO)





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