

STAMPS@CMU

STAtistical Methods for the Physical Sciences

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What is **STAMPS**? How Did it Come About?

STAtistical **M**ethods for the **P**hysical **S**ciences ([STAMPS](#))
Research Group at CMU. Founded in 2018.

Grew out of CMU [Astrostatistics](#) (started ~2000 by Larry Wasserman, Chris Genovese, and colleagues in CS and astronomy)

[STAMPS](#) expanded the scope from astronomy to include other physical sciences.

Core research group of StatsDS faculty and students at CMU.
Larger network of collaborators across campus and at other institutions.

Structure of STAMPS

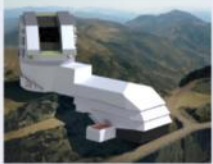
STAMPS@CMU

Foundational Methodology

Statistics
Data Science
Machine Learning / AI

Astronomy & Particle Physics

Astronomy



LSST

Particle Physics



LHC

Climate & Environment

Oceanography



Argo floats

Meteorology



GOES

Remote Sensing



OCO-2

Environmental Science



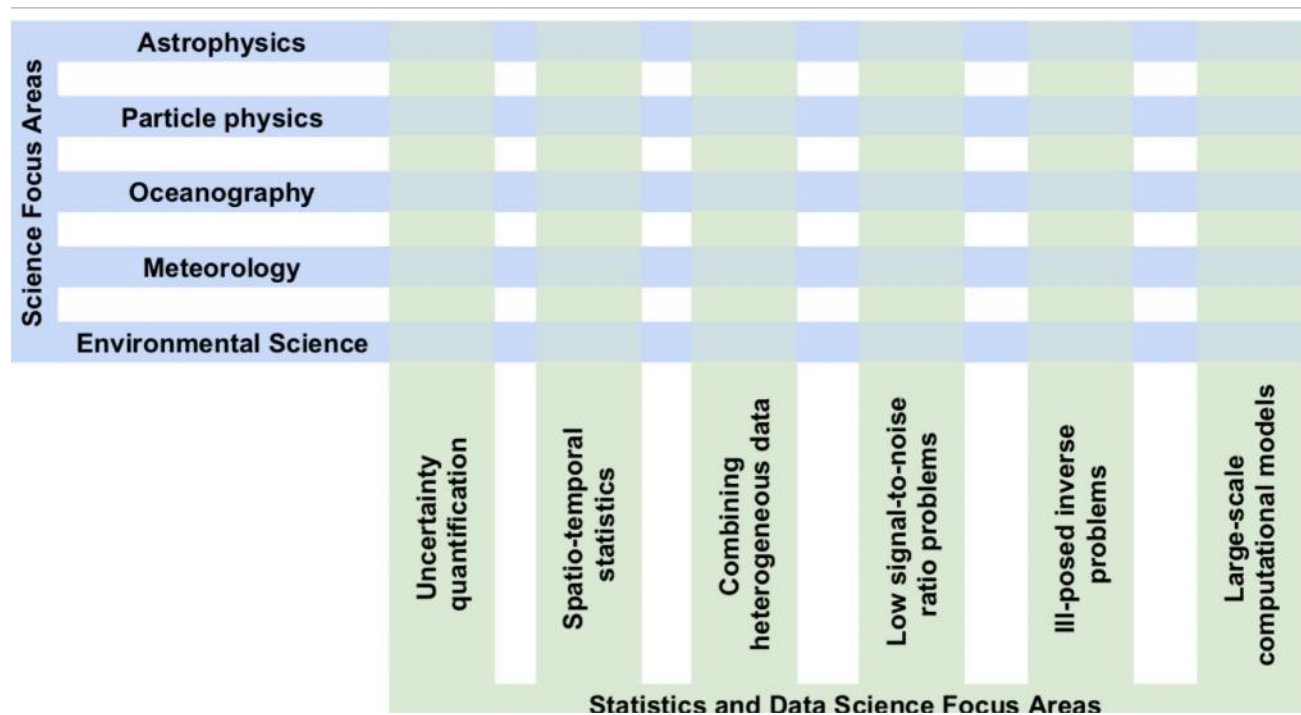
Wildfires

Two Trademarks of STAMPS

1. To build **sustained and close collaborations between Stats/ML researchers and physical scientists** to promote new scientific discovery (e.g. in cosmology and HEP) and help inform policy decisions (e.g. related to the climate and environment)
2. To tackle **the important new statistical problems** that have been emerging in the physical sciences

Key Insight Behind STAMPS: “The Matrix”

In the physical sciences, **next-generation data** come with a new set of challenges in terms of **data complexity, models, simulation and experimental design**.



New statistical methodology that addresses these emerging problems can transform practice in science and technology.

STAMPS@CMU Activities

STAMPS is one of few research groups in the US specializing in foundational statistics and AI research for the physical sciences.

Since its conception in 2018, STAMPS has built a **network** of sustained collaborations between data scientists and physical scientists nationally and internationally.

STAMPS is offering exciting **opportunities and training for students.**

STAMPS is offering **public colloquia-style webinars** open to all members of the scientific community in addition to **local group meetings** that are open to CMU and Pitt faculty and students

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stat.cmu.edu/stamps

STAtistical Methods for the Physical Sciences Research Center

About STAMPS Core Members Research Highlights Events



[Learn more about the STAMPS@CMU Research Center Launch Event - September 20, 2024](#)

Many problems in the physical sciences share common statistical challenges including heterogeneous data from multiple probes, uncertainty quantification, ill-posed inverse

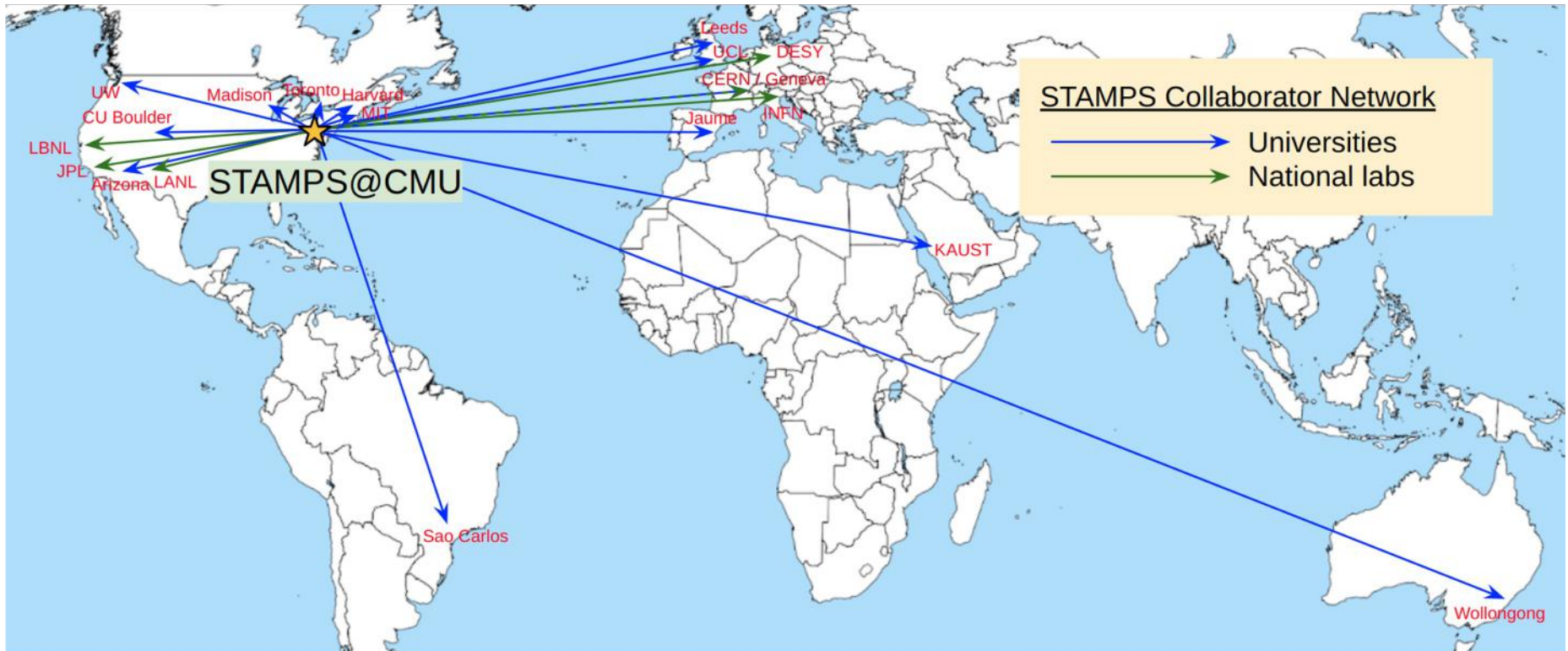
For information on [STAMPS public events](#):

Planned Activities for the New Center

STAMPS is now transitioning from a research group to a CMU Research Center

- Bring researchers and **visitors** to CMU to collaborate
- Monthly webinars/**hybrid events**
- Starting 2025: **yearly summer workshops on CMU campus on common themes**
 - Relevant for both Astro/HEP and Enviro/Climate branches, but that have traditionally been discussed in separate venues
 - Opportunity to strengthen and forge new collaborations between Stats/ML researchers and physical scientists **to develop general-purpose strategies to transfer across domains** and that are solving key problems of interest in the physical sciences

Growing Network of Collaborators



STAMPS Launch Keynote Talks

