

# UNDERGRADUATE SUMMER SCHOOL

June 26 - 30, 2023

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The Center for Matter at Atomic Pressure (CMAP) at the University of Rochester is hosting a week-long, residential summer program for undergraduate students who are eager to learn more about the physics of extreme states of matter!

CMAP consists of world-leading physicists, astrophysicists, and planetary scientists with expertise that spans theoretical and numerical modeling, and experiments. Over the course of a week, undergraduates will have access to modern computational and educational tools that they can leverage across a wide range of disciplines

Open to undergrads at U.S. colleges and universities, each student will be introduced to the science of extreme pressure in an immersive, collaborative environment. This program aims to engage undergraduate students in the field of high-energy-density physics and promote a learning environment where they are exposed to new research tools and techniques.



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# SUMMER WORKSHOPS

OVER THE COURSE OF THE PROGRAM, STUDENTS WILL USE PYTHON TO UNDERSTAND RECENT DISCOVERIES IN ASTROPHYSICS, PLANETARY SCIENCE, AND QUANTUM MATERIALS.

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## Day 1: Welcome to CMAP

- Introduction to matter under extreme conditions
- Morning: Tools to analyze and model scientific discoveries
- Guest Lecturer
- Afternoon: Introduction to Python and Jupyter notebooks

## Day 2: Collisions in Extreme Environments

- Morning: Single-particle motion
- Guest Lecturer
- Afternoon: Collisions in plasmas

## Day 3: Dense Fluids

- Morning: Conservation laws and smooth particle hydrodynamics
- Guest Lecturer
- Afternoon: Magnetohydrodynamics

## Day 4: Fun with Particles

- Morning: Ram that jet!
- Guest Lecturer
- Afternoon: Ram that jet! continued

## Day 5: Fun with Fluid Dynamics

- Morning: Build that planet!
- Guest Lecturer
- Afternoon: Build that planet! cont.

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For more information, contact Natalie Antal at [natalie.antal@rochester.edu](mailto:natalie.antal@rochester.edu).