The new Center for Energy and the Environment will play a central role within the University’s Institute for Data Science. It will leverage our research expertise in science, engineering, and health disciplines to develop new energy technologies, better understand earth system dynamics, and address the human health implications of various energy resources.

The center will provide scientists and engineers the tools to understand and solve some of the most complex issues facing our planet. Its researchers will collaborate to develop new energy technologies that will improve our quality of life and have the least amount of impact on our environment and our health.

**The Need for Carbon-Neutral Solutions**

Virtually everything that exists has a carbon footprint—a measure of the amount of carbon dioxide, methane, and related compounds emitted by people, organizations, and their activities. These gases play an essential role in regulating global temperature.

Over the years, there has been an increase in the size of our carbon footprint, which has led to higher levels of carbon dioxide and methane in the atmosphere. The resulting accumulation of carbon in the atmosphere and oceans is contributing to climate change, ocean acidification, and sea level rise. Developing carbon-neutral energy technologies is becoming increasingly important for our environment and for our health.

**Energy Technology**

Advanced computing will guide the creation of technologies that provide maximum energy production with minimal impact on the environment and health. University faculty members have already established strong programs in applying advanced materials, biotechnology, and nanotechnology to the development of alternative energy resources that can supplement, and may ultimately supplant, fossil fuels. They are conducting highly regarded programs in many areas, including solar concentrators, photovoltaics, fuel cells, and biofuels. The University’s Laboratory for Laser Energetics—home to the world’s second-largest laser—conducts fusion and high-energy physics research that could contribute toward building future energy supplies.

**Earth System Dynamics**

The Earth system—its atmosphere, oceans, biosphere, cryosphere, and geosphere—and its carbon cycle are being altered at unprecedented rates due to a combination of natural and human-influenced factors. A challenge is determining the magnitude and speed of these changes. The center will build on current research to help establish a leading program in the study of climate-carbon cycle interactions. Work on carbon cycle modeling, atmospheric modeling, and Earth system analytics will complement current strengths in field and laboratory research.

“I’ve had great support from professors, access to a vast array of tools and resources, and amazing research opportunities at Rochester. I collaborated with a graduate student to understand the Earth’s past climate and will soon drill ice and snow cores in Greenland to study global climate change. I couldn’t have asked for a better four years.”

Melisa Diaz ’14
environmental sciences major
**Human Health**

Mercury, lead, air pollutants, pesticides, plastics, copper, cigarette smoke, and diesel fumes all affect human health. As energy sources change, researchers will need to learn more about their potential effects. Researchers on the River Campus and the University of Rochester Medical Center will collaborate to expand the University’s inhalation, exposure, and toxicology program; to promote studies on the effects of environmental pollutants and toxicants; and to further studies on the role of early life exposure to toxins that develop into adult diseases.

**How to Help**

The new Center for Energy and the Environment will focus on collaborative research across science, engineering, and health disciplines, and the results will help address some of the biggest questions of our time. Please consider making a gift that will last in perpetuity.

The University seeks endowment support for
- The Center for Energy and the Environment: $5,000,000
- Distinguished professorships: $2,000,000 each
- Professorships: $1,500,000 each
- Research funds: $50,000–$500,000 each
- Graduate fellowships: $250,000+ each
- Undergraduate scholarships: $50,000+ each

One of the best ways to understand the Earth’s climate system is to look at geologic records of past climates when greenhouse gases were at different levels. Vasilii Petrenko, assistant professor in Earth and environmental sciences and the University’s first climate specialist, collects ancient ice cores from Greenland and Antarctica. He drills down through the ice, which can be up to 800,000 years old, to study past changes in greenhouse gases trapped inside air bubbles. This helps predict where the Earth’s climate is headed.

Distinguished Professor Mark Bocko, director of the Center for Emerging and Innovative Sciences and chair of electrical and computer engineering, is studying the dynamic behavior of the power grid and how to manage it with the tactical use of data—what has become known as the “smart grid.” He and his team are developing imaging, sound, and vibration sensors that will sort through information at the source, curbing the amount of transmitted data so only the most useful is passed along to people where and when they need it.

David Rich, an environmental epidemiologist in the University’s Environmental Health Sciences Center, researches exposure to air pollution and acute coronary syndromes (heart attacks), second-hand smoke and its respiratory effects in infants, and the potential health effects of hydraulic fracturing (“hydrofracking”). Deborah Cory-Slechta, a neurotoxicologist, conducts research on air pollution, too, and its relationship to behavioral issues, neurodegenerative diseases, autism, and schizophrenia. She also studies the neurotoxic effects of lead and its linkage to iron deficiency. Environmental health research by Rich, Cory-Slechta, and others will play a key role in disease diagnosis, treatment, and even prevention.

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For more information on giving opportunities, please contact

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