

Summer Institute & Research Experience

Learn Science by Doing Science

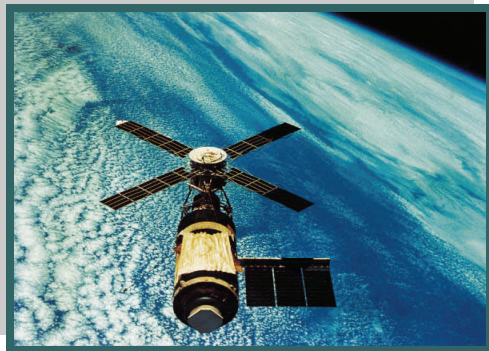
The *Los Alamos Earth and Space Science Academy (LAESSA)* program is designed for highly motivated middle school teachers. Selected teachers will be expected to commit to an intensive 3-year experience.

During the first year (Summer 2009) you will participate in a four-week Earth and Space Science Institute. You will attend presentations delivered by LANL Earth and space science experts and then explore Earth and space science concepts via field work and hands-on classroom activities.

In 2010 and 2011 you will work alongside Earth and space scientists in two 4-week summer research internships.

Application materials can be found at:

<http://www.scied.science.doe.gov/scied/ACTS/about.htm>



Probe the Scientific Foundations of Pressing Social Problems

Participate in Genuine Earth and Space Science Research Activities

Expand your knowledge about Earth and its place in the Solar System

Learn how Geology can help Solve Major Energy and Environmental Problems

Explore Heliophysics and the Impact of the Sun on Earth Systems

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**Los
Alamos
Earth and
Space
Science
Academy**

**A Teaching, Learning and
Research
Program for Science & Math
Teachers**



Earth and Space Science at Los Alamos

The Earth is under increasing strain due to the demands of human civilization. We are now at a critical point where questions regarding energy flows and environmental impacts can no longer be ignored. The *Los Alamos Earth and Space Science Academy* will provide you with practical knowledge of the basic science underlying our understanding of Earth and its place in the solar system.

Earth science research conducted at Los Alamos National Laboratory pursues questions related to:

- underground storage of radioactive waste,
- carbon sequestration,
- polar melting, and
- computer modeling of atmospheric and oceanic dynamics related to global warming.

Energy and particles ejected by the Sun play a big role in global warming and power generation. Space science research at Los Alamos is primarily focused upon heliophysics. In addition, recent achievements at Los Alamos have helped answer questions regarding extragalactic phenomena such as gamma-ray bursts. In this way, Los Alamos scientists are involved in answering questions regarding the origins of the Universe

Institute Topics

LAESSA participants will expand their science content knowledge in the following areas (not inclusive):

EARTH AND SPACE SCIENCE BASICS

- Introduction to Earth and Space Science
- LANL Earth and Space Science involvement
- The Basics (physical sciences)

SOLAR SYSTEM

- The Sun
- Solar Wind
- Magnetospheres
- Space Weather

EARTH SCIENCE TOOLS, TRICKS, TECHNIQUES

- Collecting and Analyzing Rock and Soil samples
- Reading a Landscape like a Geologist
- Mapping Subsurface Flows and Dynamics

INSTRUMENTATION

- Measuring Climate Change
- Tools for Measuring Solar and Cosmic Events
- Space-based Data Collection Campaigns in Support of Earth and Space Science

DATA PROCESSING & ANALYSIS

- Data Processing
- Data Analysis
- Modeling and Simulation

INSTRUCTIONAL APPLICATION

- Evaluate and Practice using Tested Instructional Approaches in Earth and Space Science



Teachers analyzing Space Weather data

Who among us has not asked, “Where did I come from?”

This question is usually one about life, but behind it are scientific questions about the material of which we are made, the elements in the atoms and molecules of our bodies. The answer to the question “Where did the matter we are made of come from?” is not so easy to find. Some could be satisfied with an answer such as “We are made of the same elements that are found on the Earth we live on.” But where did that material come from? The Earth is but one planet in the solar system, and most of the solar system material is inside the Sun.

“Science is more than a body of knowledge and a way of accumulating and validating that knowledge. It is also a social activity that incorporates certain human values. Students should experience science as a process for extending understanding, not as unalterable truth.”

Rutherford and Ahlgren: Science for all Americans