



# Chief Scientist, Geodynamics



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Chief Scientist, Geodynamics

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My job is to chart and understand the multitude of magnetic fields encountered in near-Earth and near-Mars space. Processes as diverse as fluid motion in the Sun and Earth, or the flow of heat out of the Earth's interior cause magnetic fields. By studying these magnetic fields we can learn about these processes and how strong they are. On a typical day, I will check and confirm results coming from three Earth-orbiting satellites with which I am involved. I'm also working with European colleagues on the development of a new Earth-orbiting mission that will use multiple satellites that are close together to map the time and space changes of the magnetic field. A typical day will also find me working with students, developing mathematical and computer-based models of Martian or Earth magnetic fields that can be compared to observations.

## How I first became interested in this profession:

I took a course in earth sciences from *Gene Shoemaker* during my freshman year in college. He was a fabulous teacher, and I began to work with him on research projects in geology and geophysics at his Caltech lab and in the US Geological Survey's lab in Flagstaff, Arizona.

## What helped prepare me for this job:

My academic training, and many years of on-the-job training with other NASA, US, and international scientists.

## My role models or inspirations:

Several teachers at Caltech, including *Gene Shoemaker*, *Heinz Lowenstam*, and *Bruce Murray*. All of them came from very practical backgrounds, in mineral or petroleum exploration, and all found underlying themes which motivated their later work and students.

## My education and training:

- B.S. in Geophysics, California Institute of Technology
- M.S. in Planetary Science, California Institute of Technology
- Ph.D. in Geology, Princeton University

## My career path:

- Seven years as a geophysicist with the U.S. Geological Survey
- Two years as an exploration geophysicist with Phoenix Corporation
- Seventeen years as a physicist at NASA

## What I like about my job:

I like that my job challenges me every day and that I can travel to and interact with colleagues in France, Denmark, and Germany.

## What I don't like about my job:

Any large bureaucracy like NASA requires constant attention, much of which is of little importance to what I want to do.

## My advice to anyone interested in this occupation:

Get the best grounding in physics, math, and Earth science that you can.

## Areas of expertise:

- Planetary magnetic fields

## Additional Resources:

- American Institute of Biological Sciences  
<http://www.aibs.org>
- American Physiological Society  
<http://www.faseb.org/aps>
- American Society for Biochemistry and Molecular Biology  
<http://www.biophysics.org/biophys/society/biohome.htm>
- American Society for Microbiology  
<http://www.asmsusa.org>
- Astrobiology Summer Academy  
<http://academy.arc.nasa.gov/>
- Biotechnology Industry Organization  
<http://www.bio.org/welcome.html>
- Education Pays Calculator  
<http://www.educationpays.org/calc.asp>
- Earth to Orbit: Engineering Design Challenges  
<http://eto.nasa.gov/>
- Graduate Student Researchers Program  
<http://spacelink.nasa.gov/Instructional.Materials/NASA.Educational.Products/Graduate.Student.Researchers.Program.Brochure/.index.html>
- MATHCOUNTS Competition  
<http://mathcounts.org/>
- Minority University Research and Education Programs  
<http://mured.nasaprs.com/>
- NASA Cooperative Education Program for college students  
<http://spacelink.nasa.gov/Educational.Services/NASA.Education.Programs/Student.Support/NASA.Cooperative.Education.Program/.index.html>
- NASA Jobs  
<http://nasajobs.nasa.gov/>
- NASA Office of Life and Microgravity Sciences and Applications  
<http://www.hq.nasa.gov/office/olmsa/>
- NASA SHARP Internship Program for high-schoolers  
<http://www.mtsibase.com/sharp/>
- NASA Student Employment  
[http://nasajobs.nasa.gov/stud\\_opps/employment/index.htm](http://nasajobs.nasa.gov/stud_opps/employment/index.htm)
- NASA Student Involvement Program student contests  
<http://www.nsip.net/index.cfm>
- Order NASA career videos such as "Engineers: Turning Ideas into Reality," "Careers: Aerospace Engineer" or "Reaching for the Stars" from NASA CORE.  
<http://core.nasa.gov>
- Revolutionary Vehicle Concepts and Systems student competition  
<http://avst.larc.nasa.gov/competitions.html>
- Student's Guide to Astrobiology  
<http://www.astrobiology.com/student.html>
- Tech-Interns.com  
<http://www.tech-interns.com/>

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Thank you.

