Introduction to Virtual Institutes and the NAI

Presented to the NASA Advisory Council

by

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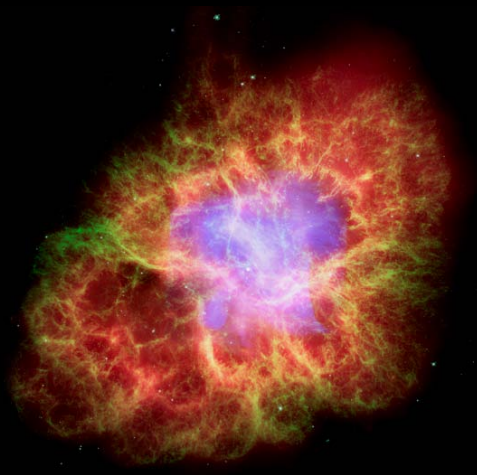
Astrobiology addresses three fundamental questions

- How does life begin and evolve?

- Does life exist elsewhere in the universe?



- What is the future of life on Earth and beyond?

Astrobiology: The Catalytic Event

- 7 Aug. 1996: NASA announces possible evidence of biological activity in Martian meteorite ALH 84001
- Announcement leads to a “Space Summit” workshop with then Vice President Al Gore.
- NASA’s FY 1998 budget includes $1B/year increase for “Origins Program,” including increased funding for Mars and outer planets exploration, SOFIA, SIRTF/Spitzer, and new Astrobiology Program.

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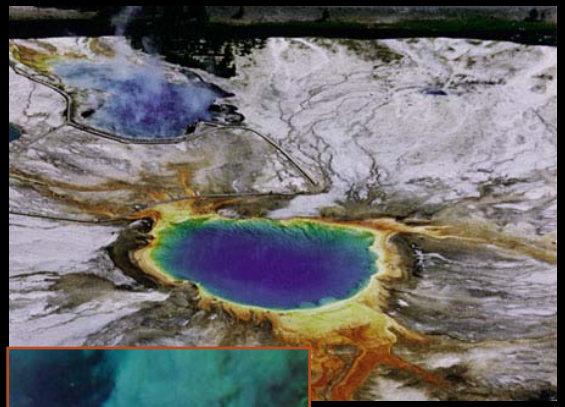
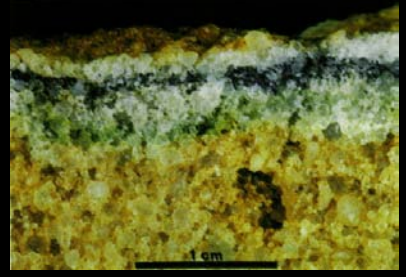
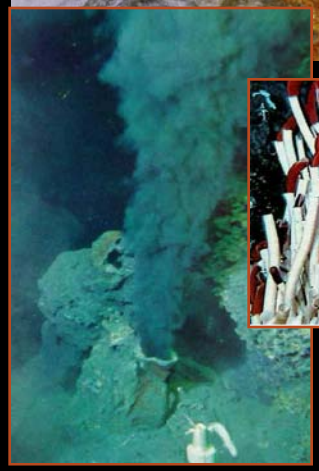
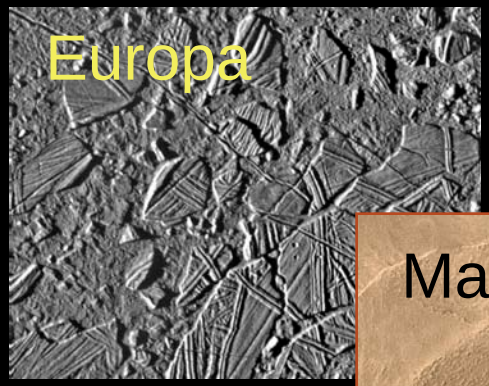
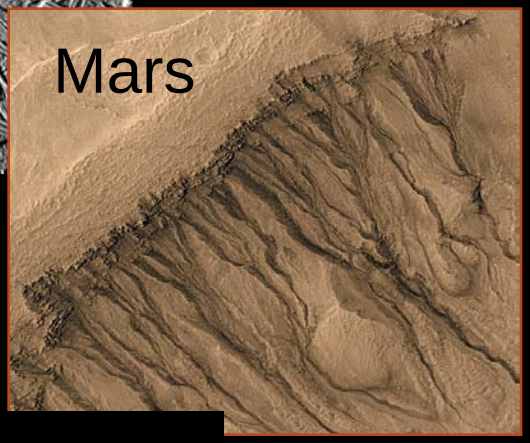
A Convergence of Scientific Discoveries

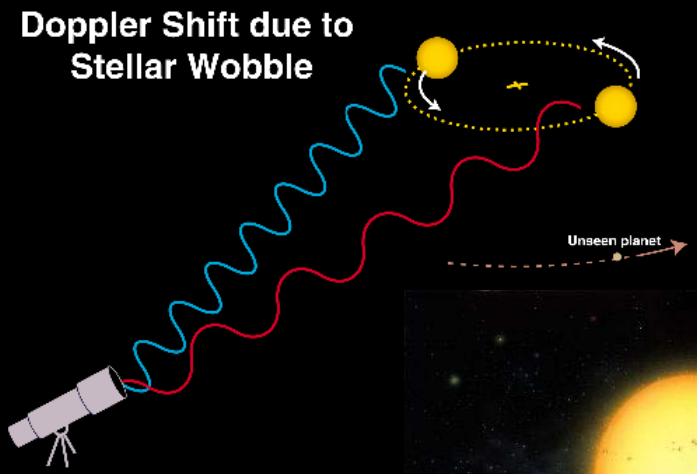


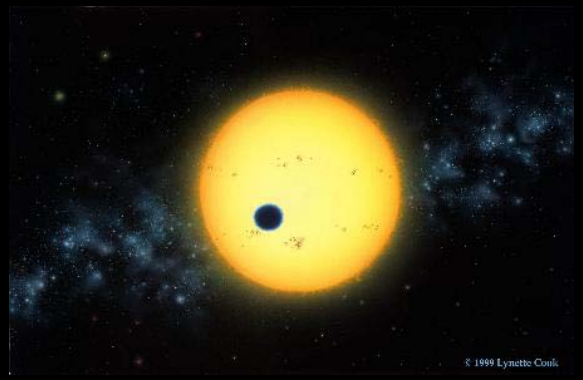












Evolution

Earth Science

Geology

Physics

Paleontology

Astronomy

COLLABORATION

Chemistry

Biology

Planetary Science

Philosophy

NAI Overview

- 'Virtual' institute 'without walls'
- 14 competitively-selected science teams (each a consortium)
- ~600 members at ~150 participating institutions

  ~400 "senior" scientists / ~200 postdocs and students /
  ~16 members of the US National Academy of Sciences

- Managed/integrated by a central office at NASA Ames Research Center

International Partners

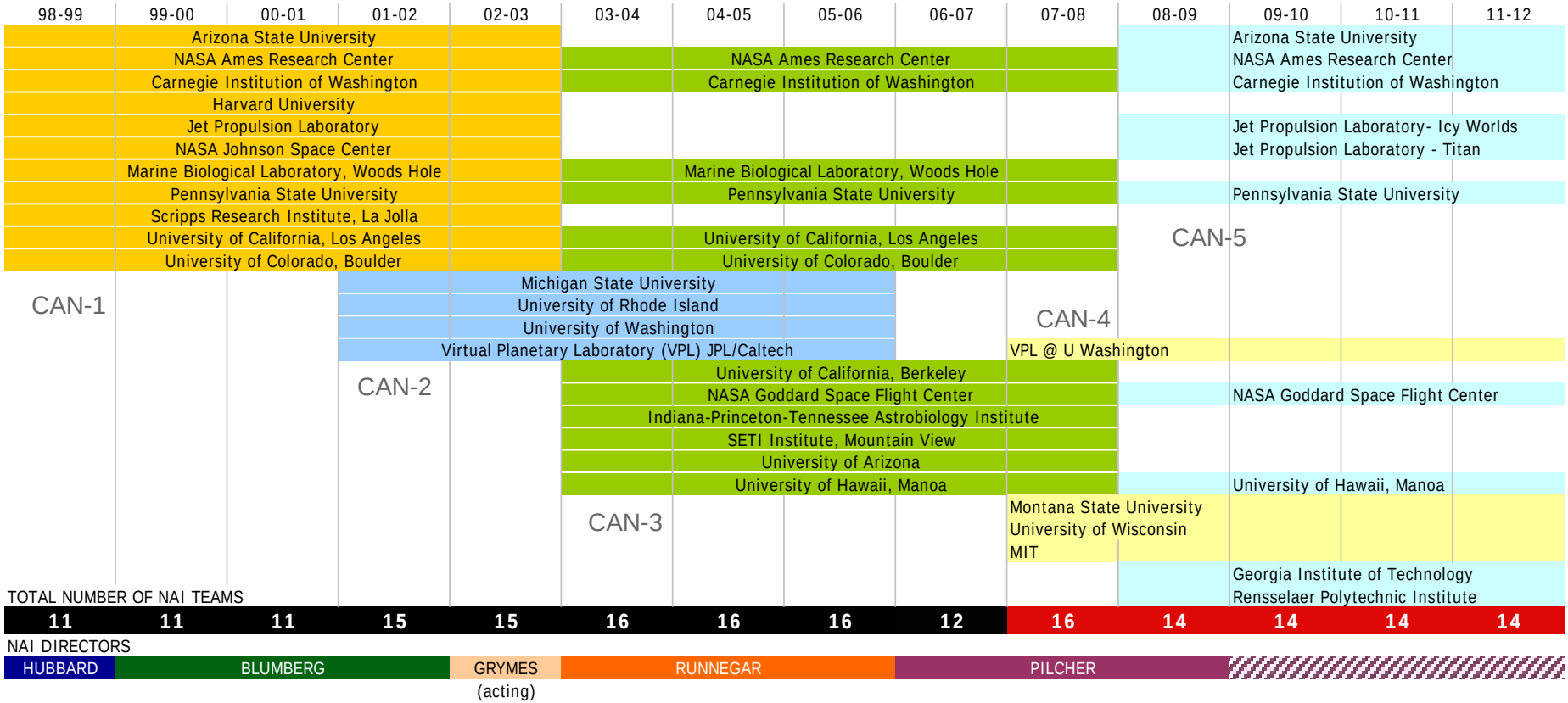
Associate

Centro de Astrobiologia (Spain)
Australian Center for Astrobiology

Affiliate

Astrobiology Society of Britain
European Astrobiology Network Association
Groupement de Recherche en Exobiologie
Russian Astrobiology Center

NAI History



International Associates

Centro de Astrobiologia (Spain)
Australian Centre for Astrobiology

International Affiliates

Astrobiology Society of Britain
Groupement de Recherche en Exobiologie
European Exo/Astrobiology Network Association
Russian Astrobiology Center

NAI Mission

- Carry out, support and catalyze collaborative interdisciplinary research

- Train the next generation of astrobiology researchers

- Provide scientific and technical leadership on astrobiology investigations for current and future space missions

- Explore new approaches using modern information technology to conduct interdisciplinary and collaborative research amongst widely-distributed investigators

- Support outreach by providing scientific content for K-12 education programs, teaching undergraduate classes, and communicating directly with the public

Other NAI Programs

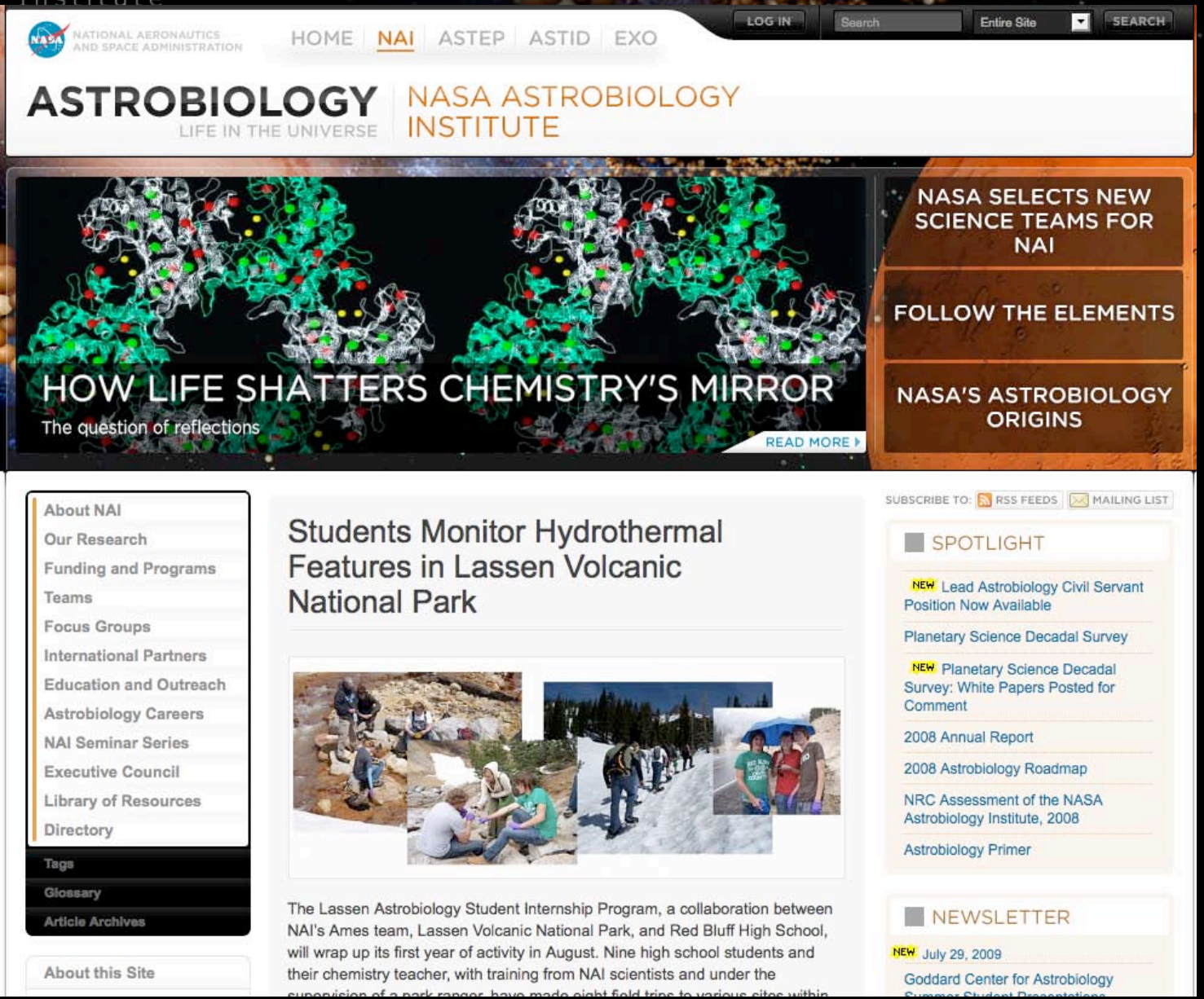
- Focus Groups
- Postdoctoral Fellowship Program *(for graduate students)*
- The Lewis and Clark Fund for Exploration and Field Research in Astrobiology *(for students)*
- Research Scholarship Program *(for students)*
- Minority Institution Research Support Program
- Meeting and Workshop Fund
- Education and Public Outreach

How does NAI contribute uniquely to astrobiology research?

- NAI requires the formation of broad interdisciplinary teams to address questions in astrobiology requiring collaboration between diverse disciplines and resources beyond those typical of most grant programs
  - Research ranges, for example, from basic research about the origin and evolution of life on Earth to research focused on supporting space flight missions
  - 5-year research plans
- NAI further integrates these teams with each other and the community to address timely issues in astrobiology emerging from current research and space flight mission planning (complements and broadens 5-year research programs)
  - Workshops (“at a distance” by means of collaborative technologies and in person)
  - Focus Groups
  - Director’s Discretionary Fund
  - Other collaborative funding opportunities
- NAI thereby also creates a broad interdisciplinary forum in which individual researchers can consider the Big Picture, and take this perspective to their individual research and mission activities

NAI Website

http://astrobiology.nasa.gov/nai



Intended for

- »Science-interested public
- »Educators/ students
- »NAI researchers and the astrobiology science community

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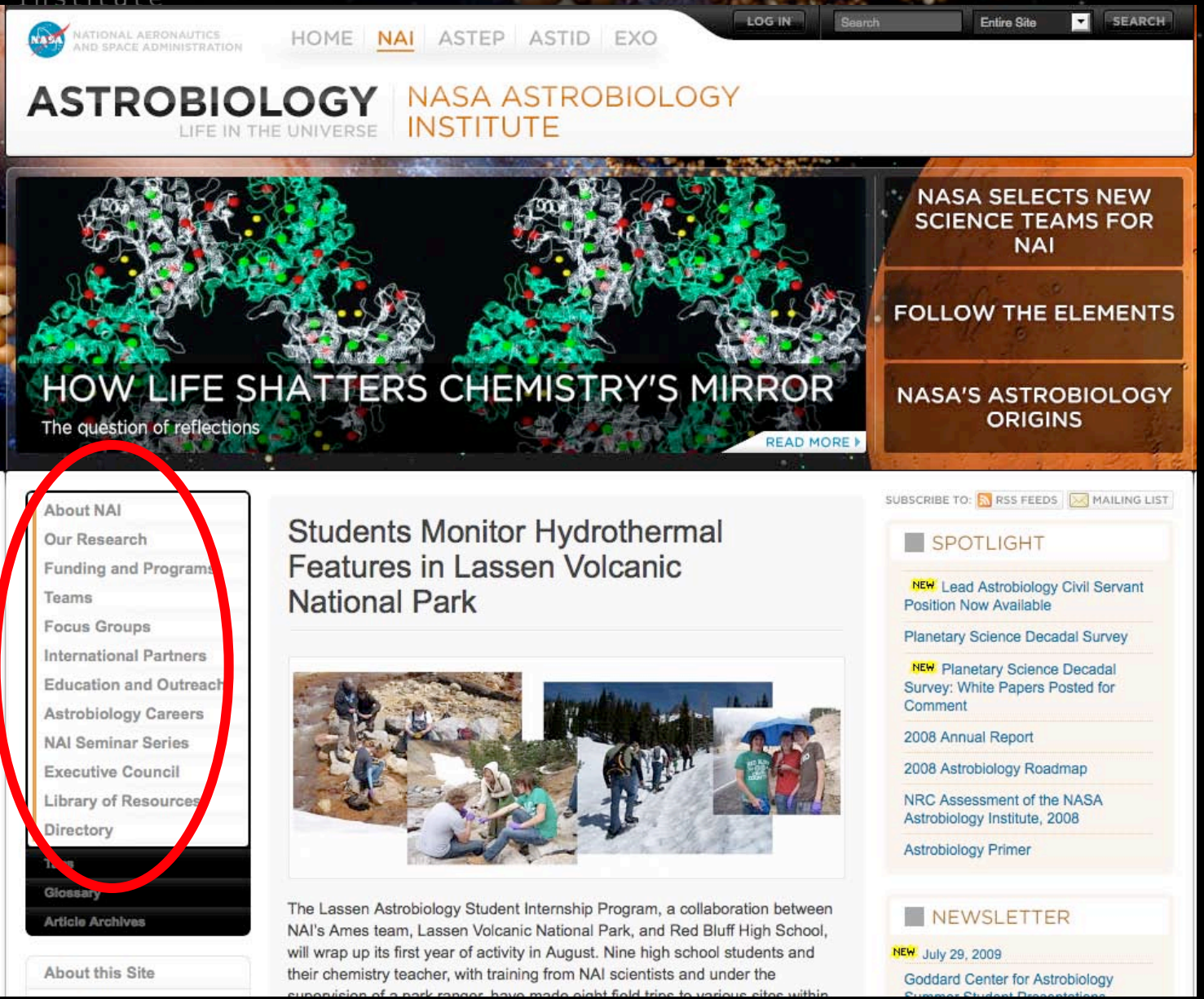

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NAI Education & Public Outreach

For Teachers

Astrobiology Education Poster
~90,000 copies distributed

Astrobiology Summer Science Experience for Teachers
SETI Institute
July 12-19, 2009

Astrobiology Laboratory Institute for Instructors
University of Hawai'i
July 6-11, 2009

Advanced Astrobiology For Teachers
3-credit graduate online course
National Teachers Enhancement Network
Fall Semester, 2009

For Students

Exxon Mobil Bernard Harris Summer Science Camp
"The Quest for Life"
Rensselaer Polytechnic Institute
June 14-26, 2009

Summer Undergraduate Internship in Astrobiology
NASA GSFC
Summer, 2009

Lassen Astrobiology Internship Program
Lassen Volcanic National Park
Sept. 2008 - August 2009

For the Public

Minor League Baseball Game
Madison, WI "Mallards"
June 5, 2009

Storytelling at Cherokee Pow Wows
Co-mingling science and cultural knowledge
June 6 and Oct 3, 2009

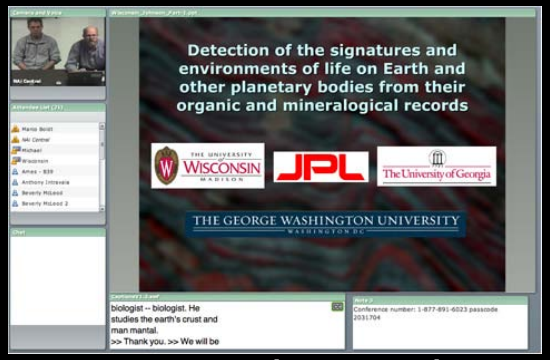
NAI Collaborative Tools: approach

Astrobiology Institute

Make a suite of tools available…

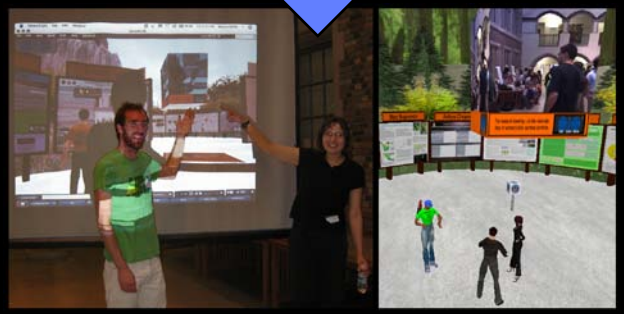
- Web sites
- Videoconferencing (room based and desktop)
- Telecons
- Adobe Connect
- Online recordings
- Podcasts
- Secure Work groups
- 3-D Immersive Environments
- Virtual worlds
- Social networking tools
- Online office tools: Google groups, Google docs etc

Virtual workshops



NAI Seminar series

Use them in various ways…

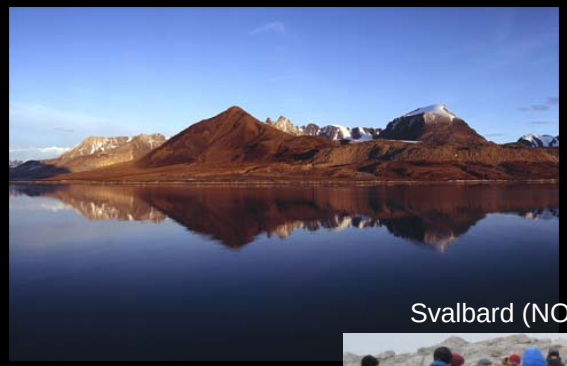


Mixed reality meeting

NAI International Partnerships

Kamchatka (RUSSIA)

Rio Tinto (SPAIN)



Svalbard (NORWAY)

Research

Pilbara (AUSTRALIA)

Leadership

Centro de Astrobiologia (SPAIN)

Australian Centre for Astrobiology

Training

Santander Summer School (SPAIN)

Findings and Recommendations

Overall, the committee is unanimous in finding that the NAI has fulfilled its original mandate. The NAI has played a key role in supporting the development of astrobiology, has positively affected NASA's current and future missions, and should continue to be supported.

http://www.nap.edu/catalog.php?record_id=12071#toc
or link from NAI home page