



**NASA ASTROBIOLOGY INSTITUTE**  
**ANNUAL REPORT YEAR**  
 [July 2002 - June 2003]



Project Report: Biological Consequences of Impacts

<b>Lead Team:</b>	<i>Impacts</i>
<b>Project Title:</b>	<i>Biological Consequences of Impacts</i>
<b>Project Investigators:</b>	<i>Peter Ward , Frank Kyte</i> <a href="#">[view project member list]</a>

Project Progress

The impact of asteroids, comets, and other objects must play a fundamental role in the origin, evolution, and extinction of life. Impacts are a primary mechanism of planetary accretion and are responsible for the delivery of water and organic matter to young planets. Large-body impacts may inhibit the formation of life in the early history of planetary development. Once life has taken hold, impacts can play an important role in the path followed by evolution, such as the mass extinctions that are now known to be coincident with the Chicxulub impact event at the Cretaceous-Tertiary boundary. This is not just a terrestrial problem. If life exists on Mars, Europa, or other planets outside our solar system, impacts must have played a fundamental role there as well. Impact may even play a role in transporting organisms between planetary objects.

The NAI Impact Focus Group can aid in coordinating the research in this field. Understanding the processes that relate impacts to the origin and evolution of life is an inherently interdisciplinary problem that requires expertise in diverse fields ranging from astronomy to paleobiology. The Impacts Focus Group can play an important role in bringing these experts together, developing collaborations, coordinating research, and organizing meetings and field trips for research and educational purposes. We believe that this can best be accomplished with a series of workshops that will be aimed at bringing participants together in an interactive setting for the purpose of identifying specific problems and achievable goals, followed up by actual sample collection and analysis. This is still a very new focus group. Our plan is to organize a workshop of interested parties on an annual basis to develop these collaborations.

Highlights

- Papers from the Rubey Colloquium on "Impacts and the Origin, Evolution, and Extinction of Life" were published in the Spring 2003 issue of Astrobiology.

- A Field expedition was made to collect Triassic/Jurassic (T/J) samples.
- Focus Group Members Don Lowe and Gary Byerly organized a field conference on Archean Surface Processes in Barberton, South Africa. Although this conference focused mainly on processes of the early Earth, it included examination of the oldest known impact deposits on Earth (3.2 to 3.5 Ga).

Roadmap Objectives

- [Objective No. 1.1: Models of formation and evolution of habitable planets](#)
- [Objective No. 4.3: Effects of extraterrestrial events upon the biosphere](#)
- [Objective No. 6.2: Adaptation and evolution of life beyond Earth](#)

Field Expeditions

**Field Trip Name:** Triassic/Jurassic sampling

<b>Start Date:</b> 4/8/03	<b>End Date:</b> 4/11/03
<b>Continent:</b> North America	<b>Country:</b> USA
<b>State/Province:</b> Nevada	<b>Nearest City/Town:</b>
<b>Latitude:</b>	<b>Longitude:</b>
<b>Name of site(cave, mine, e.g.):</b> New York Canyon	<b>Keywords:</b>
<b>Description of Work:</b> Collection of fossils and samples for geochemical analysis at a classis [PLS VERIFY SPELLING] Triassic/Jurassic boundary section	
<b>Members Involved:</b>	