



***NIAC Phase I Fellows Meeting***

***October 23-24, 2002***

***NIAC Headquarters  
Atlanta, Georgia***

- Changed NIAC Logo



- Released CP 02-01 Phase II Call for Proposals in July with a due date of December 2, 2002.
- Released CP 02-02 Phase I Call for Proposals on September 26, 2002 with a due date of February 17, 2003.
- Space Elevator Workshop - August 12-13, 2002.
- Robert Michelson, GTRI received Pirelli Prize for Entomopter.
- USRA/ANSER/NIAC Booth at AIAA World Space Congress.
- Numerous publicity and outreach activities.
- Several NIAC concepts recognized in NASA long range plans, NEXT.

8:00am – 8:30am

**Registration**

8:30am – 9:00am

**Welcome – NIAC Status Report and Plans for the Future**

Robert A. Cassanova, NIAC Director

9:00am – 10:30am

**Keynote Speaker**

Robert Michelson, Georgia Tech  
*21<sup>st</sup> Century Aerial Robotics*

10:30am – 10:45am

**Break**

10:45am – 12:15pm

**NIAC Status Reports**

*(30 mins.)*

**Anthony Colozza**  
Ohio Aerospace Institute  
*Solid State Aircraft*

*(30 mins.)*

**Constantinos Mavroidis**  
Rutgers University  
*Protein Based Nano-Machines for Space Applications*

*(30 mins.)*

**Hod Lipson**  
Cornell University  
*Autonomous Self-Extending Machines for Accelerating Space Exploration*

12:15pm - 1:30pm

**Lunch** (*buffet in Atrium*)

## ***Keynote Speaker: Professor Robert Michelson***

***Past President, Association for Unmanned Vehicles Systems International***

***Principal Research Engineer, Aerospace, Transportation, & Advanced Systems Laboratory, Georgia Tech Research Institute***

***Adjunct Associate Professor, School of Aerospace Engineering at the Georgia Institute of Technology***

***Invited Lecturer on Micro Air Vehicle technology at both the von Karman Institute for Fluid Dynamics and the Royal Military Academy in Brussels.***

***Creator and Organizer of the annual International Aerial Robotics Competitions.***

## ***Robert Michelson, Designer of the Entomopter, Receives Pirelli Prize***

The “Entomopter” advanced concept that is sponsored by NIAC has just received international recognition! Rob Michelson, who is a Professor and Principal Research Engineer at Georgia Tech, has received a prestigious award – ***the Pirelli Prize*** – for his work on the Entomopter. NIAC is funding a Phase II contract with the Ohio Aerospace Institute (OAI) for development of the Entomopter system, and Rob Michelson at the Georgia Tech Research Institute leads the development of the Entomopter flying vehicle through a sub-contract with OAI.

The link to the announcement is: <http://www.pirelliaward.com/web/index.html>.

Here’s a quote from the Pirelli Prize announcement:

*“After evaluating more than 1,000 entries, the International Jury has assigned the various awards for this edition, subdivided into two main categories: “educational” and “environment.” The 25,000 Euros worth of Top Pirelli Prize was won by Professor Robert Michelson, Georgia Institute of Technology, USA. His work was awarded as the best product coming from any school, college, university or research center and simulates a mission to Mars, actually planned by NASA for the period 2013-2017, performed by Michelson’s candidate – the Entomopter – a revolutionary, flying/crawling machine fueled by a new chemical energy named reciprocating chemical muscle.”*

Professor Michelson has additional information about the Entomopter on his website at: <http://avdil.gtri.gatech.edu/RCM/RCM/Entomopter/EntomopterProject.html>, which features the Entomopter in a simulated mission to Mars.

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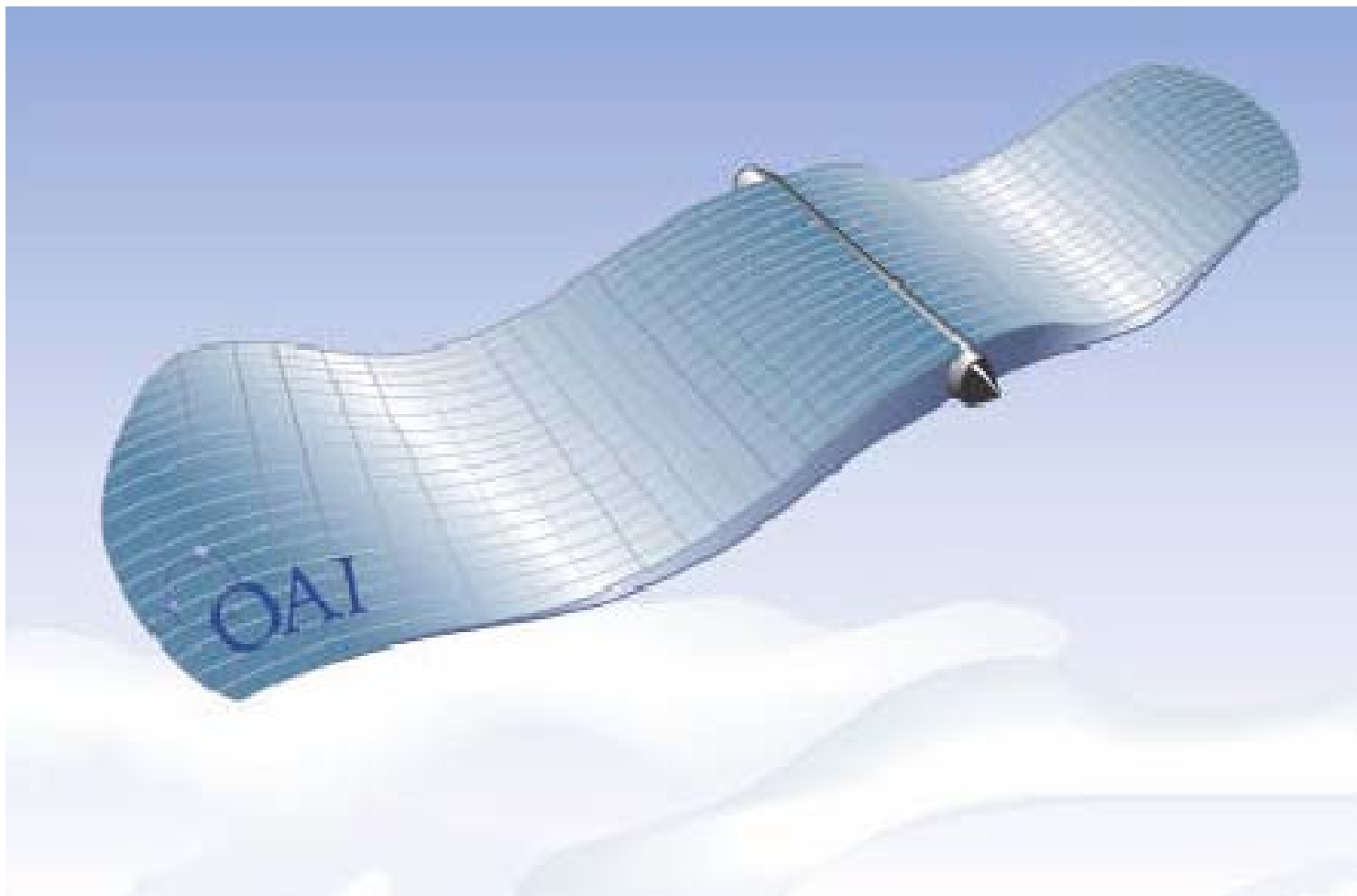
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**Hod Lipson**  
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*Autonomous Self-Extending Machines for Accelerating Space Exploration*

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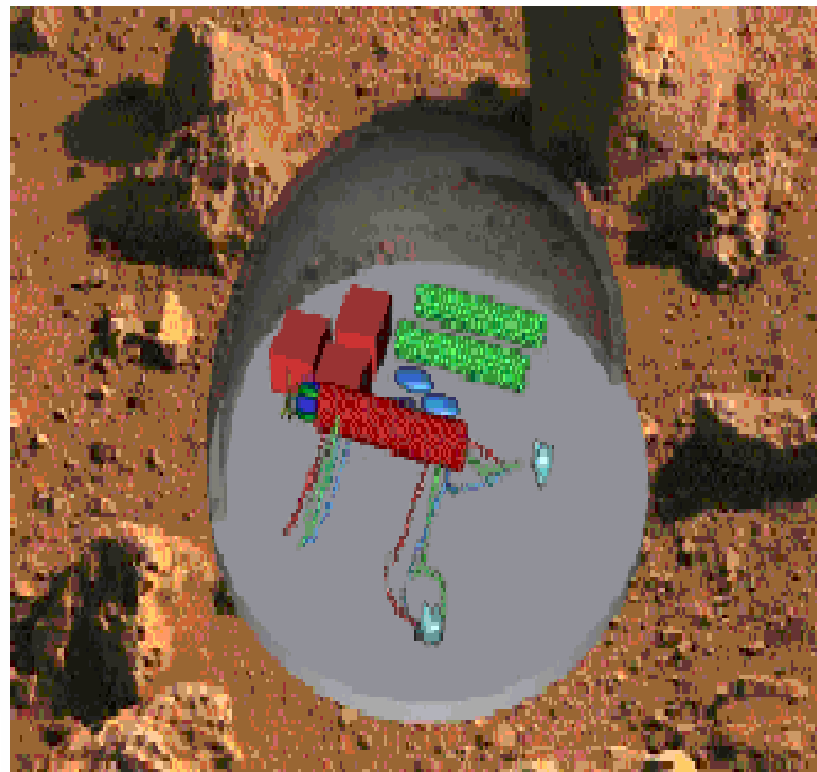
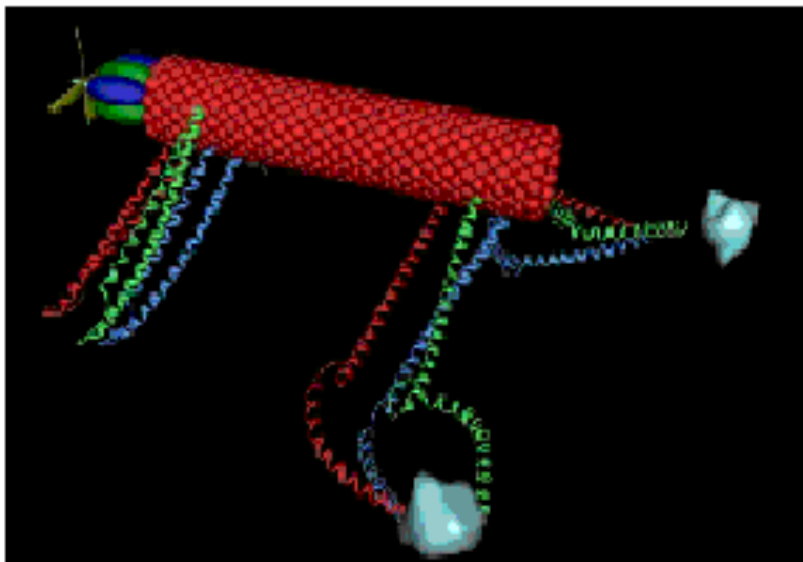
**Lunch** (*buffet in Atrium*)

**Anthony Colozza**  
**Ohio Aerospace Institute**



# *Protein-Based Nano-Machines for Space Applications*

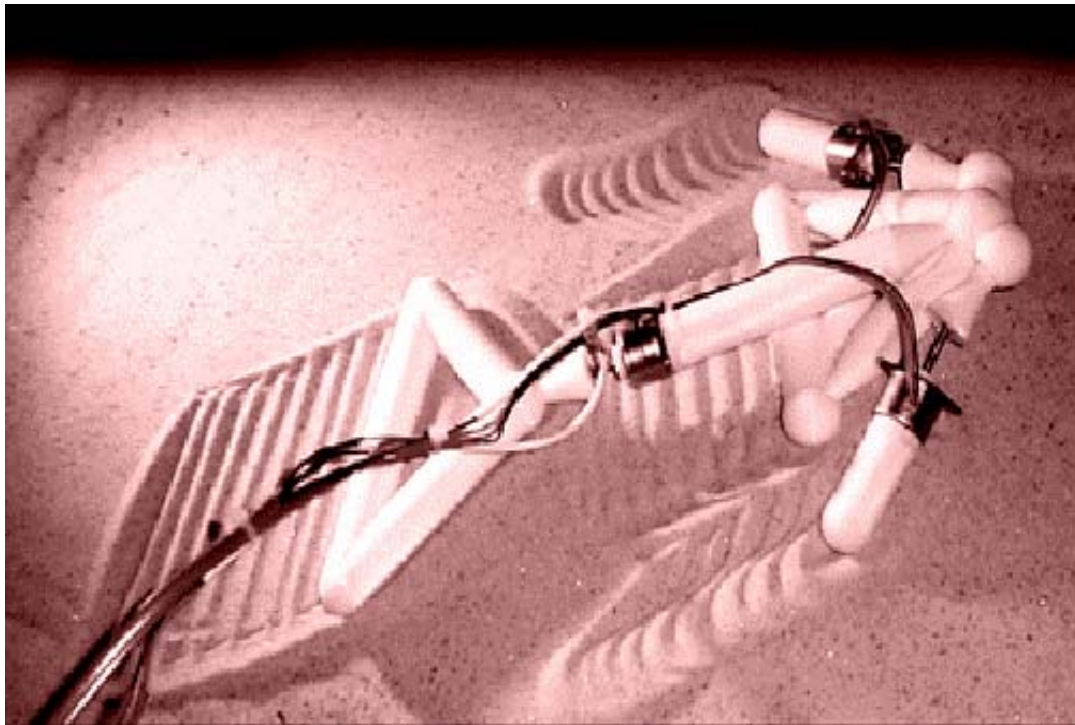
**Constantinos Mavroidis**  
Rutgers University





# Autonomous Self-Extending Machines for Accelerating Space Exploration

**Hod Lipson**  
Cornell University



1:30pm – 3:00pm

**NIAC Status Reports**

(30 mins.)

**Nilanjan Sarkar**

Vanderbilt University

*A Novel Interface System for Seamlessly Integrating Human-Robot Cooperative Activities in Space*

(30 mins.)

**David Wettergreen**

Carnegie Mellon University

*Planetary Circumnavigation*

(30 mins.)

**Alexey A. Pankine**

Global Aerospace Corporation

*Planetary Science from Directed Aerial Robot Explorers*

3:00pm – 3:30pm

**Break**

3:30pm – 4:30pm

**NIAC Status Reports**

(30 mins.)

**Elizabeth McCormack**

Bryn Mawr College

*Investigation of the Feasibility of Laser Trapped Mirrors in Space*

(30 mins.)

**Seigo Ohi**

Howard University

*The Hematopoietic Stem Cell Therapy for Exploration of Space*

4:30pm - 5:00pm

**Discussion**

5:00pm - 7:00pm

**Reception (Atrium)**

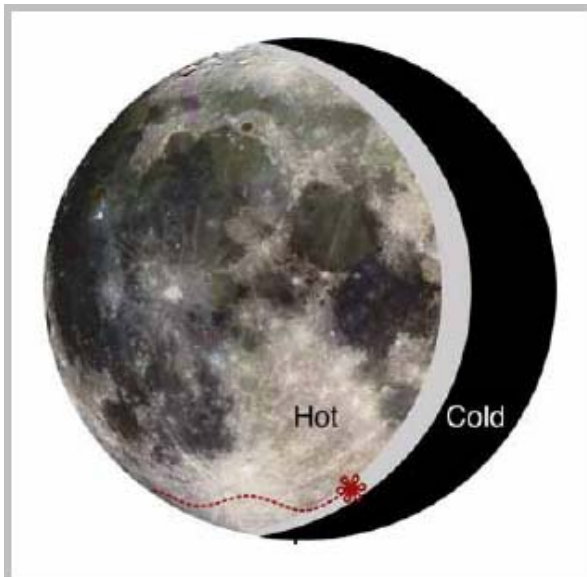
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**Vanderbilt University**

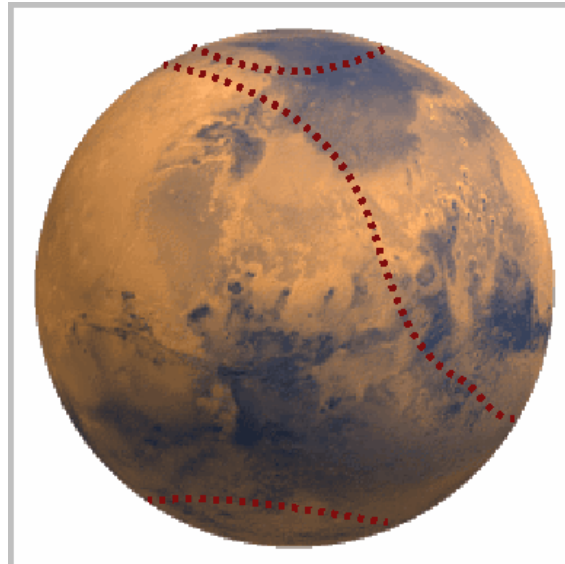


# Planetary Circumnavigation: A Concept for Surface Exploration of the Inner Planets

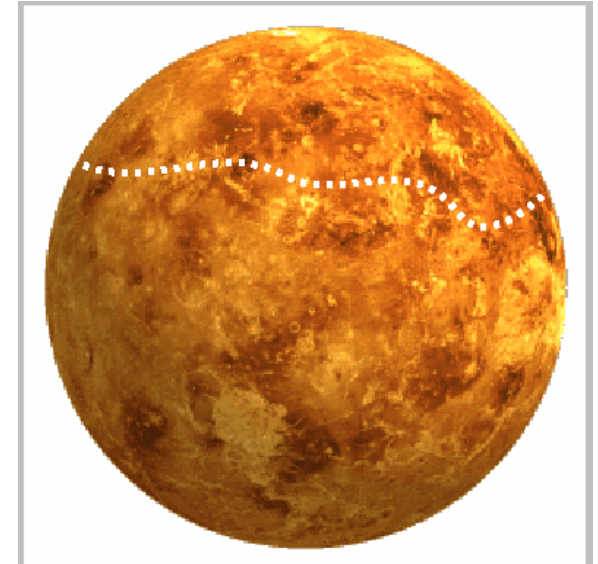
David Wettergreen and William Whittaker  
Carnegie Mellon University



**Moon:** Circumnavigation of the polar regions could follow the terminator in a region of moderate temperature to encounter rills, exposed bedrock, and ground ice trapped in perpetually shadowed craters.



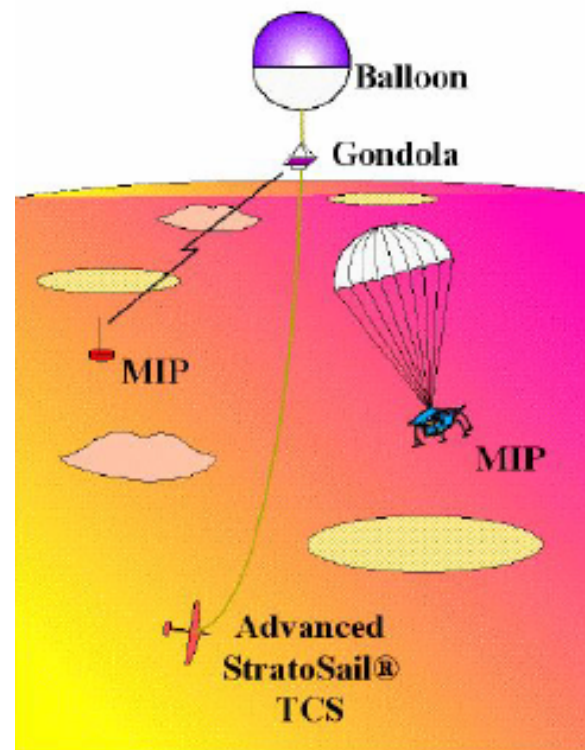
**Mars:** Axial inclination similar to Earth provides extended periods of sunlight in the polar regions where the investigation of annual water ice and evidence of life could proceed before crossing the equatorial volcanic plateaus and alluvial features enroute to the other polar circle.



**Venus:** Intense heat and pressure are challenges in circumnavigation. The period of rotation (retrograde) is slow to effort investigation of atmospheric, tectonic and corrosive erosion in what may be the least understood but most Earth-like of planets.

# Planetary Science from Directed Aerial Robot Explorers

**Alexey A. Pankine**  
Global Aerospace Corporation



1:30pm – 3:00pm

(30 mins.)

**NIAC Status Reports**

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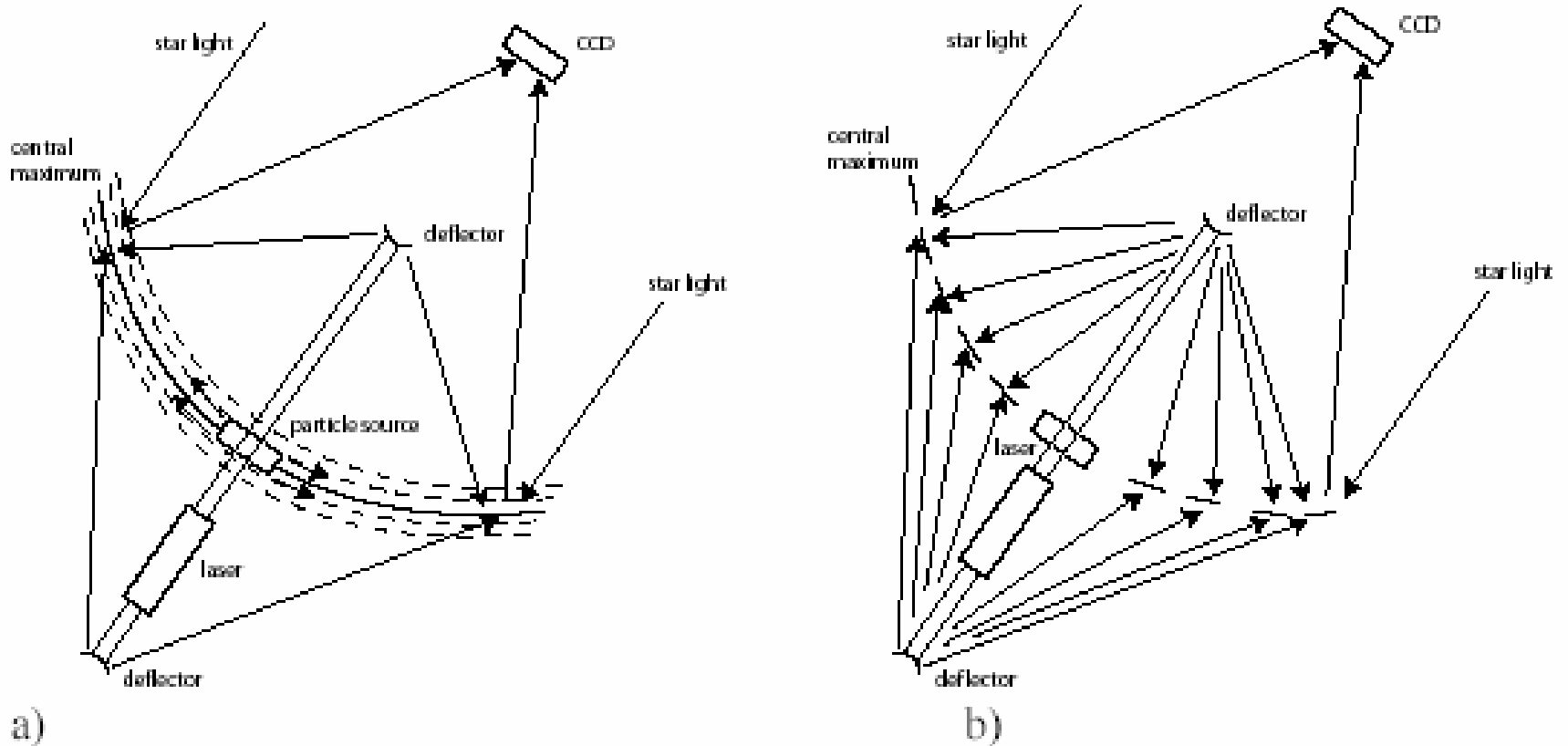
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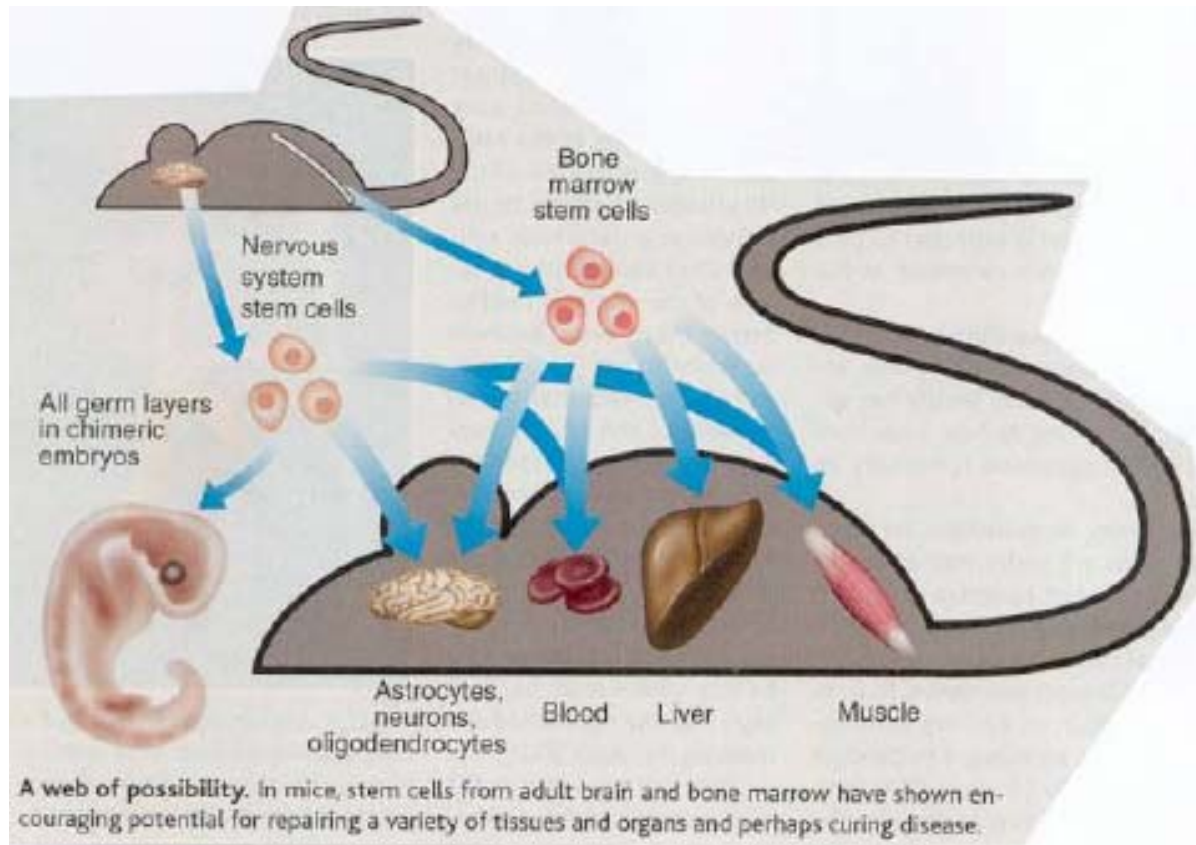




# Hematopoietic Stem Cell (HSC) Therapy for Exploration of Space

Seigo Ohi

Howard University and Hospital

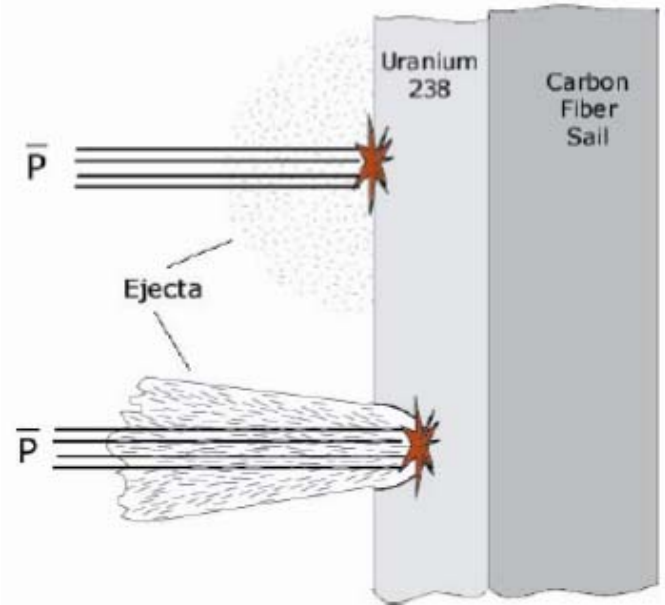
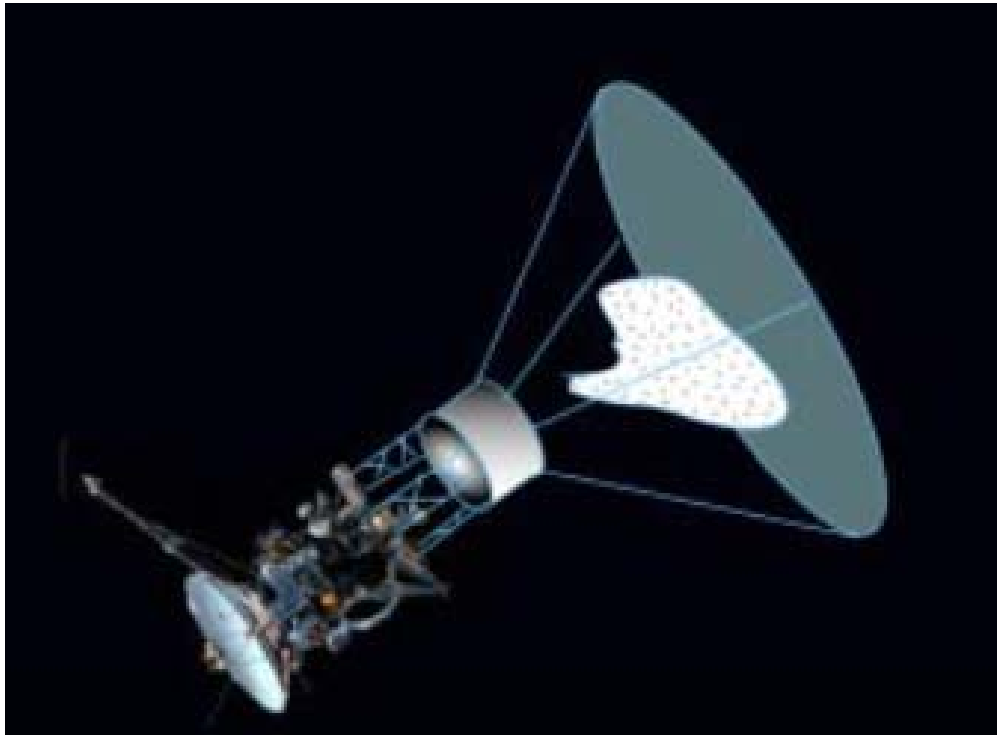




|                                 |  |
|---------------------------------|--|
| 9:00am                          | <b><u>Welcome</u></b><br>Robert A. Cassanova, NIAC Director  |
| 9:00am – 10:30am<br>(30 mins.)  | <b><u>NIAC Status Reports</u></b><br><b>Steven D. Howe</b><br>Hbar Technologies, LLC<br><i>Antimatter Driven Sail for Deep Space Missions</i>  |
| (30 mins.)                      | <b>Anthony J. Marchese</b><br>Rowan University<br><i>The Black Light Rocket (BLR) Engine</i>   |
| (30 mins.)                      | <b>Joseph Carroll</b><br>Tether Applications, Inc.<br><i>Space Transport Development using Orbital Debris</i>  |
| 10:30am – 10:45am               | <b>Break</b>   |
| 10:45am – 12:15pm<br>(30 mins.) | <b><u>NIAC Status Reports</u></b><br><b>Narayanan M. Komerath</b><br>Georgia Institute of Technology<br><i>Tailored Force Fields for Space-Based Construction: Key to a Space-Based Economy Organization</i> |
| (30 mins.)                      | <b>Parviz Soroushian</b><br>Technova Corporation<br><i>Inherently Adaptive Structural Systems</i>  |
| (30 mins.)                      | <b>A. C. Charnia</b><br>SpaceWorks Engineering, Inc. (SEI)<br><i>Networks on the Edge of Forever: Meteor Burst (MB) Communication Networks on Mars</i>   |

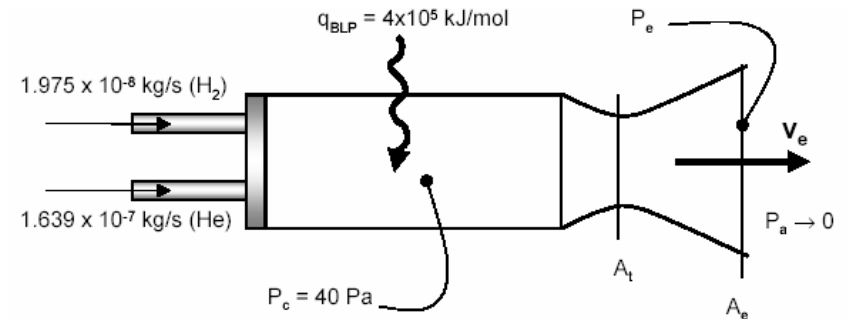
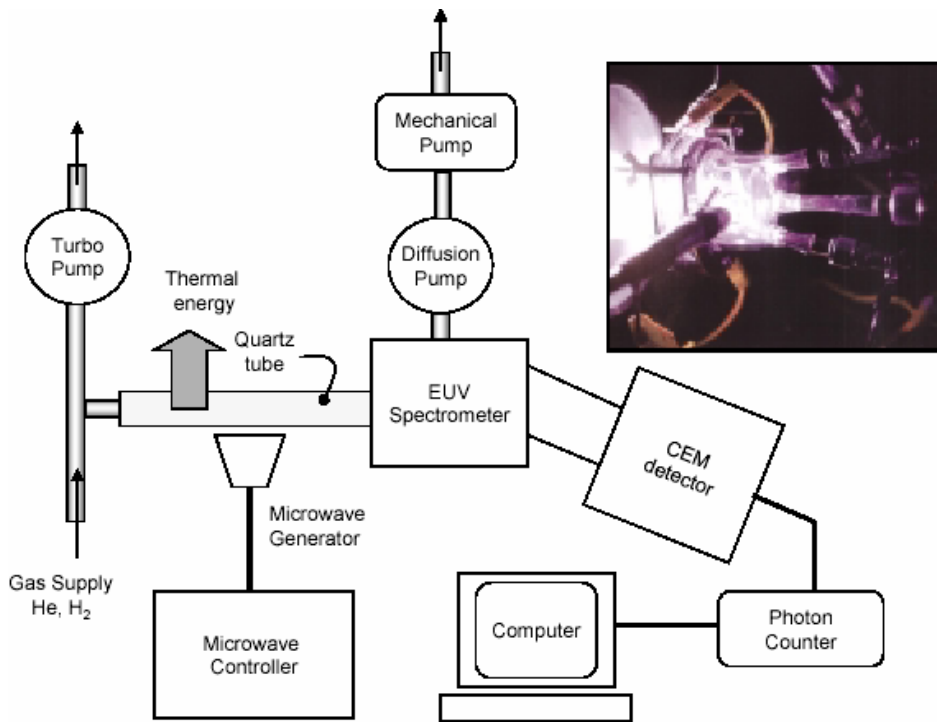
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Steven D. Howe  
Hbar Technologies



# The BlackLight Rocket (BLR) Engine

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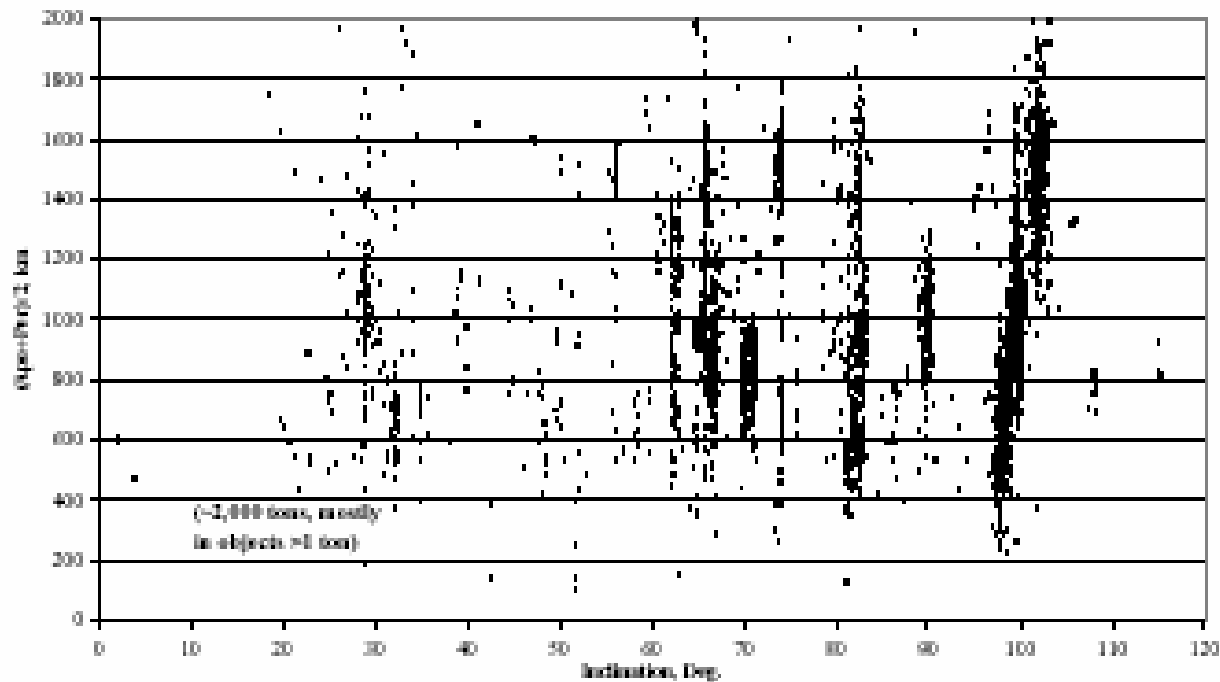


# Space Transport Development using Orbital Debris

**Joseph Carroll**  
**Tether Applications, Inc.**

Space Transport Development Using Orbital Debris  
NIAC 2002 Phase I Grant to Tether Applications, Inc.

Inclination and Altitude of All Tracked Low-Orbit Objects (May 2002)



9:00am

Welcome

Robert A. Cassanova, NIAC Director

9:00am – 10:30am

NIAC Status Reports

(30 mins.)

**Steven D. Howe**

Hbar Technologies, LLC

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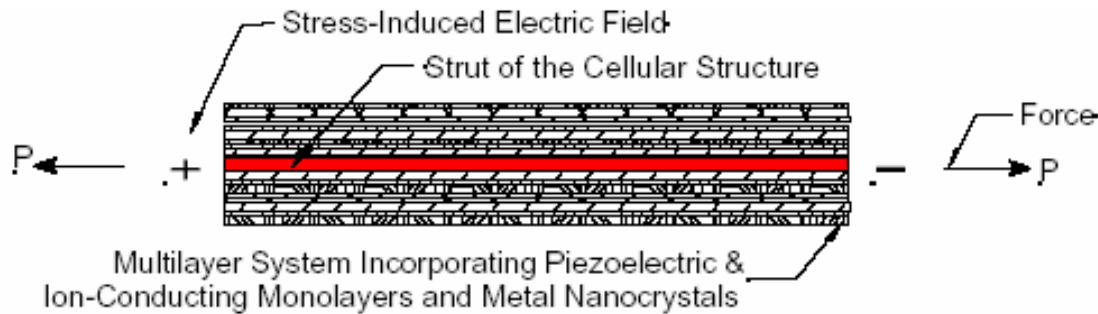
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# Tailored Force Fields for Space-Based Construction

Narayanan Komerath  
Georgia Tech



**Parviz Soroushian**  
**Technova Corporation**



(a) The Strut Embodying Structural, Piezoelectric and Electrochemical Constituents

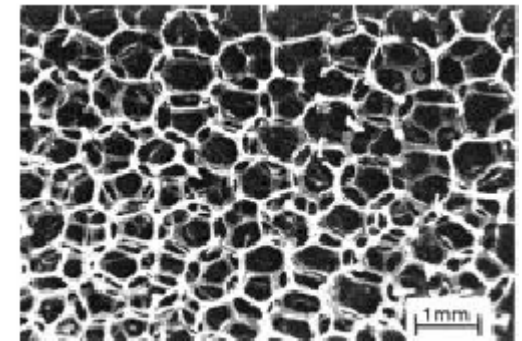
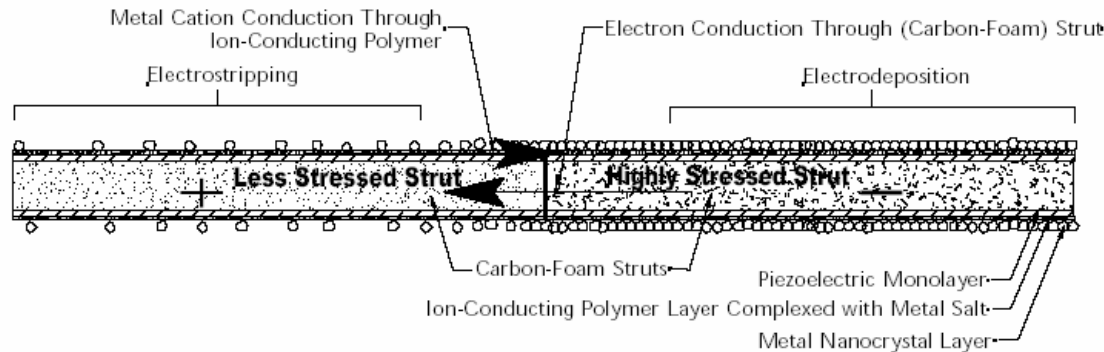


Figure 1. Open-Cell Carbon Foam.<sup>5</sup>



(b) Schematic Presentation of Stress-Induced Electrostripping and Electrodeposition Phenomena

Figure 2. The Self-Adapting Hybrid Multilayer System Built Upon the Struts of An Open-Cell Structure.

# ***Networks on the Edge of Forever: Meteor Burst (MB) Communication Networks on Mars***

**A. C. Charania**  
**SpaceWorks Engineering, Inc.**





12:15pm – 1:15pm     **Lunch** (*buffet in Atrium*)

1:15pm – 2:45pm

**Keynote Speaker**

**Seth Shostak**

Search for Extraterrestrial Intelligence (SETI) Institute

*The Search for Cosmic Company*

2:45pm – 3:00pm

**Break**

3:00pm – 4:00pm

**NIAC Status Reports**

(30 mins.)

**John Manobianco**

ENSCO, Inc.

*Global Environmental MEMS Sensors (GEMS): A Revolutionary Observing System for the 21<sup>st</sup> Century*

(30 mins.)

**David W. Miller**

Massachusetts Institute of Technology

*Electromagnetic Formation Flight (EMFF)*

4:00pm – 4:30pm

**Discussion**

4:30pm

**Adjourn**

## **Keynote Speaker: Dr. Seth Shostak**

***Senior Astronomer for the SETI Institute***

***Distinguished Lecturer for the American Institute for Aeronautics and Astronautics***

***Author of the popular book, **Sharing the Universe*****

***Produced a series of lectures on tape and video on the subject of SETI. For more information visit the [Teaching Company website](#).***

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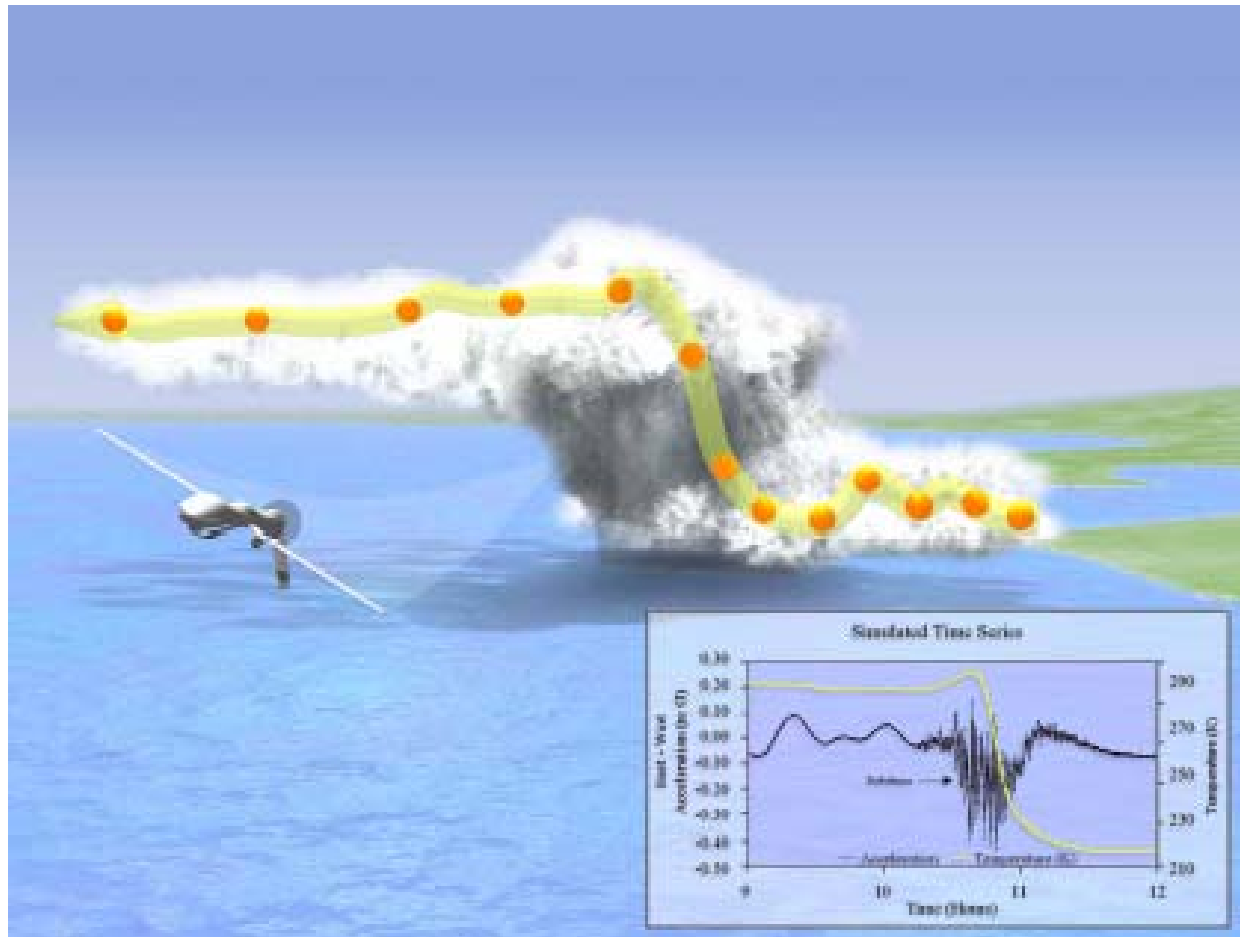
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Raymond Sedwick  
MIT

