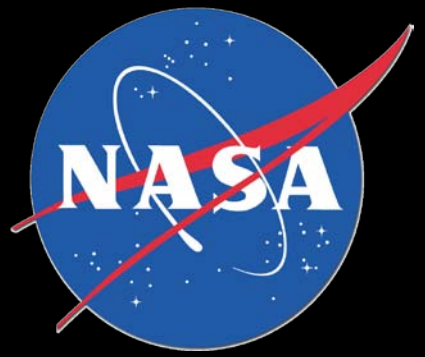
Pennsylvania Space Grant Consortium: Hands-on Science and Engineering Programs

Christopher H. House

Heather Nelson, PSGC Assistant Director
Linda Altamura, PSARC Administrative Assistant
Linda Bell, PSGC Administrative Manager
Alli Fox, PSGC Program Coordinator

November 3, 2011



NASA Pennsylvania Space Grant Consortium

- Mini-grant support to U. of Penn, Lehigh University, Penn State – Wilkes-barre, Astrobotics, Lunar Lion, etc.

- Fight Vehicle Design and Fabrication (Penn State)

Meredith Perry, uBeam, LLC

- University Student Launch Initiative & Student Space Programs Laboratory (Penn State)

- Student Space Exploration and Environmental Systems Laboratory (Temple) & Drexel Space Systems Lab

- Penn State Astrobiology Research Center

Fight Vehicle Design and Fabrication

- Space Grant supported
  "Sailplane Class" (AERSP 2/404H)

- **Students placed in aerospace careers**

"Participation in the Space Grant program encouraged me to pursue a degree and a career in aerospace engineering."

- Kirstin Bossenbroek (2004),
  Liaison Engineer on the Boeing 787 program

Fight Vehicle Design and Fabrication

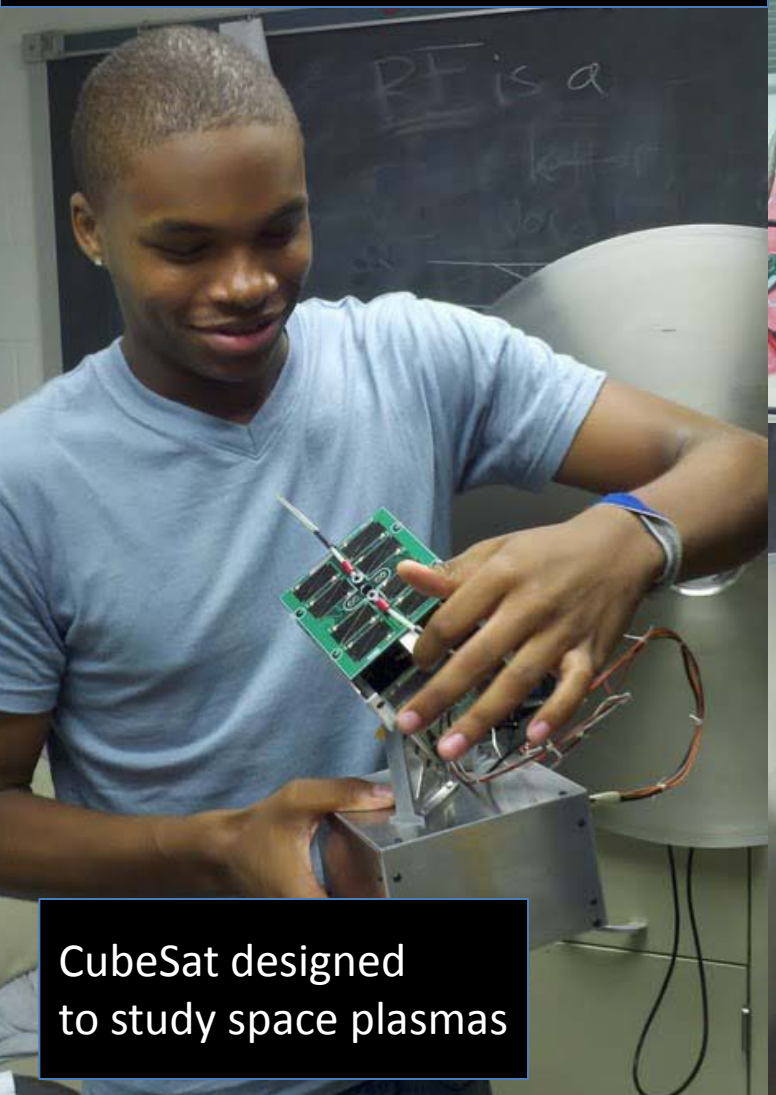
- Successful Maiden Flight of PSU Zephyrus (Monday, April 15, 2011)
- Moving toward human-powered flight
- For Kremer International Sporting Aircraft Prize

University Student Launch Initiative

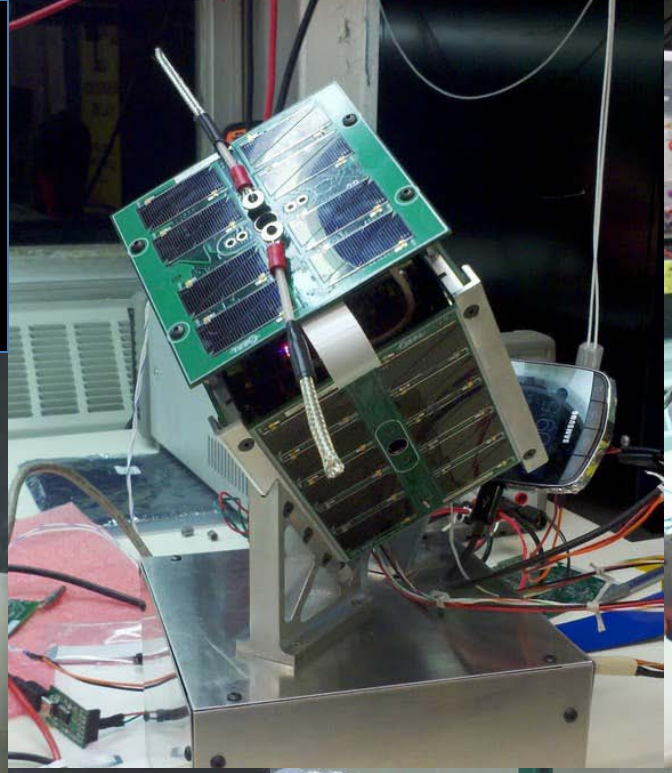
- 18 students traveled to Huntsville, AL for PSU's first entry into the University Student Launch Initiative
- Flawless flight of a 6" high-powered model rocket
- Established popular high-powered rocketry club

Penn State University Student Launch Initiative

Student Space Programs Laboratory



CubeSat designed to study space plasmas



Student Space Exploration and Environmental Systems Laboratory (Temple)

- Experiments on RockSat
- Designed and constructed an active vibration suppression system
- Lunar Excavator Contest (ESMD)

Drexel Space Systems Lab

- Newest affiliate (after seed-grants),
- NASA Microgravity flight
- High-altitude balloon program
- RockSat - Harness rocket vibration to charge satellite flights

- DragonSat-1 (launch 2012)
  take pictures of aurora,
  observe the radiation dissipation intensity,
  demonstrate boom deployment mechanism

DREXEL SPACE SYSTEMS LAB
DRAGON SAT 1
DRACO MISSION

Penn State Astrobiology Research Center (PSARC)

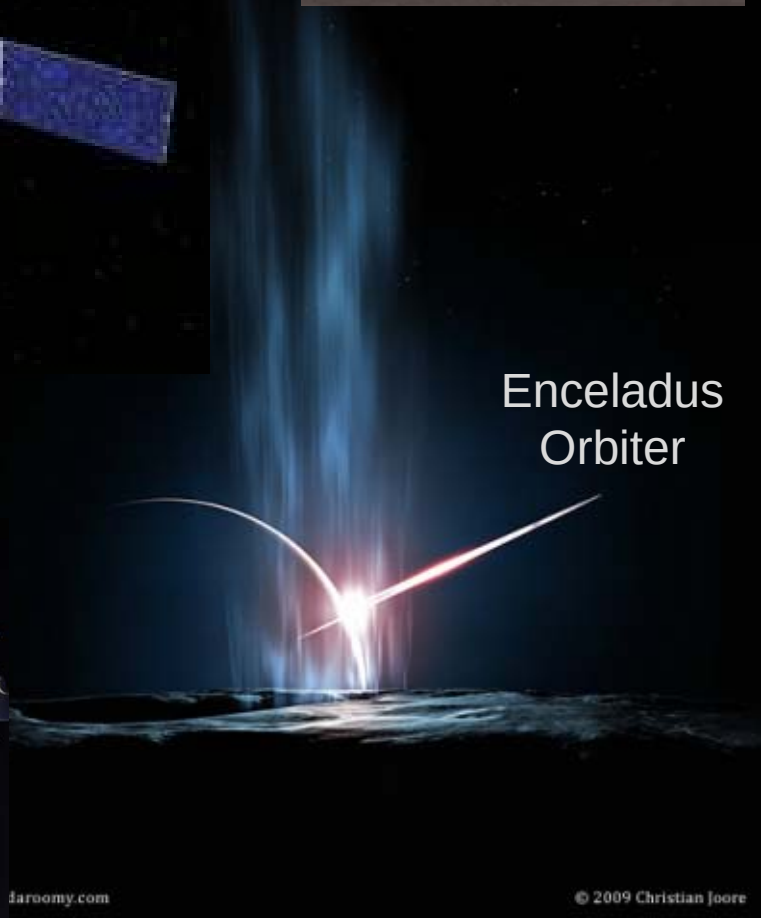
Developing New Biosignatures, Biosignatures in Mission Relevant Environments, Biosignatures in ancient rocks, and Biosignatures from Extraterrestrial Environments

- Astronomy: Sigurdsson, Wright, Mahadevan and the PSU Center for Exoplanets & Habitable Worlds
- Atmospheric Chemistry: Lyons (UCLA) & Kasting
- EPO: Heather Nelson & the PA Space Grant Consortium
- Evolutionary Genetics: Hedges & Shapiro
- Geobiology: Macalady, Orphan (Caltech), Patzkowsky, House, & Schopf
- Geochemistry: Arthur, Brantley, Fantle, Freeman, Kump, McKeegan (UCLA), & Ohmoto
- Microbiology and Biochemistry: Bakermans, Brenchley & Ferry

59 PSARC Completed Ph.D. Students

N. Suits ’98; L. Brown ’99; A. Pavlov ’01; B. Borup ’01; S. Ono, ’01; P. Iver ’01; R. Hotinski ’02; M. Van Tuinen ’02; K. Yamaguchi ’02; Y. Watanabe ’02; H. Pointkiviska ’03; M. Borda, ’03; M. Hurtgen, ’03; S. Lawrence, ’04, A. Herrmann, ’04; F. Cruz, ’04; S. Shipkowski ’05; P. Kharecha, ’05; J. Blair, ’05; J. Eigenbrode, ’04; J. Debes, ’05; H. Buss, ’06; J. Biddle, ’06; A. Zerkle, ’06; Z. Krug, ’06; A. Smirnov, ’06; C. Cohn, ’06; C. Turich, ’06; S. Stafford, ’06; J. Moran, ’07; E. Herman, ’07; D. Hydutsky, ’07; S. Zimmerman, ’07; S. Goldman, ’07; M. Bachmann, ’07; K. Panchuk, ’07; A. Mandell, ’07; A. Riccardi, ’07; F. Battistuzzi, ’07; V. Cameron, ’08; L. Hausrath, ’08; B. Thomas; ’08, K. Meyer '08; A. Edson ’08; L. Horodyskyj ’09; E. Patridge ‘09; E. Beal ’09; M. Heinicke ’09; K. Moody ’09; B. Kimball ’09; M. Reichlen ‘10; J. Fulton; ’10; C. Junium ‘10; M. Wang ‘10; A. Diefendorf ’10; Haqq-Misra, ‘10; K. Dawson, 11; D. Jones, ’11; M. Rhodes‘11

NASA Missions related to Astrobiology



Penn State Astrobiology Research Center Internship

- Maryland Space Grant Consortium
  (place students at SMD ‘missions’)

- Top applicant - Zoe Todd (a high school student ?!?!)

Penn State Astrobiology Research Center Internship

- Maryland Space Grant Consortium (place students at SMD ‘missions’)

- Top applicant - Zoe Todd (a high school student ?!?!)

  Physics 211 – General Physics: Mechanics
  Astro 291 – Astronomical Methods and the Solar System
  Physics 212 – General Physics: Electricity and Magnetism
  Math 251H – Ordinary and Partial Differential Equations
  Econ 4 – Introductory Macroeconomic Analysis
  Astro 292 – Astronomy of the Distant Universe
  Physics 213 – General Physics: Fluids and Thermal Physics
  Physics 214 – General Physics: Wave Motion and Quantum Physics
  Math 230 – Calculus and Vector Analysis
  Chem 110 – Chemical Principles 1
  EMET 397A and INTST 497A - Study abroad trip to Germany

Habitable Zone Planet Finder Instrument

- Large infrared spectrograph for McDonald Observatory
- Capable of detecting Earth-size planets in the Habitable Zone around M-dwarfs
- Funded this Fall ($3.3 million - NSF)

- Prototype detector built with seed funding from NASA Astrobiology Institute (NAI), NASA Origins, and… Space Grant (graduate RAs for project)
- ‘Contingent’ on partnership with PSU, NAI & Space Grant

New proposal to NASA ASTEP – Extensive Astrobiological Exploration of the Sub-ice Terror Rift, Antarctica

Mount Erebus

Next Mid-Atlantic Meeting

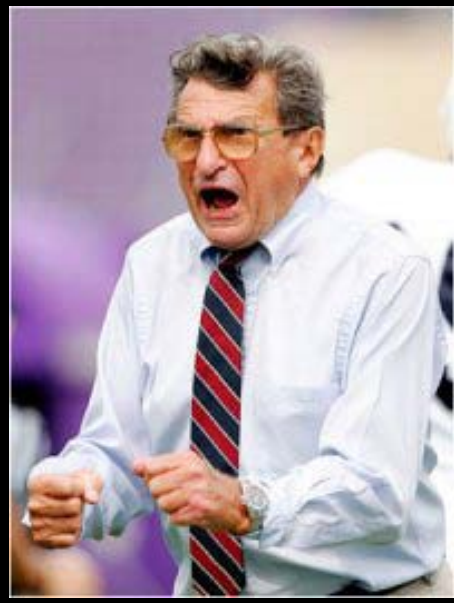
Club Quarters, Downtown Philadelphia

Dates: Thursday, Sept. 20 to Saturday, Sept. 22, 2012

Two room options: Standard - $149, Superior - $169

Parking: $21/day

…. Or we can wait until 2013???



Or we can meet in Happy Valley…
(Atherton Hotel, State College, PA)