Astrobiology

3 fundamental questions

How does life begin & evolve?

Does life exist elsewhere in the universe?

What is the future of life on Earth & beyond?
Where does astrobio fit?

Astrobiology

Astronomy & Astrophysics

Extreme Environments

Geology

Hydrology

Geophysics

Mineralogy

Geochmistry

Chemistry

Biology

Physics

Engineering
Concerns

- Program “stove-piping” as an inhibition to cross-cutting work
  - Missions
  - Ground-based research
  - Cross-disciplinary proposals

- Level of scientific approach – e.g. hypothesis-driven vs. discovery-driven

- Fundamental vs. situational science

- Mismatch of end-goals

- Metrics of performance, “proof”, what is valuable science

- Cross disciplinary “suspicion”

Antidotes

- Communication between communities!
- Grassroots demand!

- Becoming “multi-lingual”, i.e. terminology issues

- Proposing to astrobiology programs requires framing in astrobiology terms
- And ditto to other programs
Astrobiology Prime Challenges According to PJB

- **Interdisciplinary synthesis is fundamental.**
- Exploration science and hypothesis-driven reductionist science… How do they fit together?
- Legacy science!
- Mid-term experimental & observational science
- Universal biosignatures?
- Mathematical methods for mass data analysis.
- Modeling of planetary habitat processes
- Take a clue from Barry Blumberg, role of virus-sized entities in astrobiology?
- More more more!
The Future of NAI According to PJB

- Honoring NAI’s history while seeking to improve and advance our science & impact on missions.
- Where is the NAI working?
- Where should tweaking occur?
- Is connectivity working as planned?
- How can we become more inclusive in an era of flat budgets???
- Co-evolution of science and enabling technology, grassroots up or top down?
- New technologies drive science, enhance interactions with STMD? national labs (e.g. Brookhaven?, etc.
- Planetary Protection folded in at a high level.
- Reaching “across the aisle” to Astrophysics-Astronomy on the issue of exoplanets
- Open to other ideas from the community!

Pulsar PSR B1257+12 with 3 planets
Sprinkling of stardust, Planet cauldron, add water... Voila! Here comes Life!