

# Development of a White Paper on Mars Sample Return for the 2013-2023 Planetary Science Decadal Strategy

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# From Ideas to White Papers: Flagship Examples from Space Science

- What was Proposed?
- How the Proposer Selected Topic
- Forming a Team
- Developing a White Paper

*[Note: This discussion is based largely on my experience with the planetary sciences decadal strategy a decade ago. Your activity may have some differences.]*

# What was Proposed?

- White paper submitted in 2009 for the Visions and Voyages 2013-2023 decadal survey for planetary sciences (the next decadal is just now beginning)
- “*Are There Signs of Life on Mars? A Scientific Rationale for a Mars Sample-Return Campaign As The Next Step in Solar System Exploration*”, by B. Jakosky, R. Zurek, J. Amend, M.H. Carr, D.J. McCleese, J.F. Mustard, K. Nealson, and R. Summons
- We argued that:
  - Searching for evidence for life was the highest scientific priority for Mars exploration, and the science has led us to being ready to answer that question
  - This could best be carried out by returning samples to Earth from a carefully selected site on Mars
  - Sample return would provide the biggest advance across all of Mars science
  - Sample return would also advance general solar-system science significantly
  - We are ready both scientifically and technologically to carry out a sample-return mission
- Mars sample return ended up being the highest-priority recommendation for a Flagship mission; currently being implemented (Mars 2020 *en route*, later missions in formulation)

# How the Proposer Selected Topic

- Range of white papers
  - ~700+ expected for the current planetary science decadal that is just beginning
  - Span range including specific, narrow research areas, mission concepts (from small cubesats up to flagship missions), programmatic issues (such as intellectual drivers of the program, technology needs), data archiving and access, demographics of community (e.g., diversity of mission PIs)
- Our white paper
  - We (first two authors) thought that sample return and search for evidence of life was the most-important science for Mars, and that it required a champion in order to garner support for it
    - Recognized increasing importance of astrobiology questions in solar-system exploration
    - Previous Mars exploration had led to (i) now being able to pose and answer the question, and (ii) it being the right next step in Mars exploration
    - Sample return was at critical juncture of whether it might go ahead or not
  - Neither of us had a direct personal stake in whether we did MSR, other than for the benefit of the science community, and neither was planning to submit a different white paper
    - Jakosky is PI of the MAVEN mission that at that time had just recently been selected via competition for formulation (and is now in orbit at Mars); recommended by *previous* decadal
    - Zurek is chief Mars scientist in the Mars program office at JPL, with broad scientific perspective on ongoing Mars program and future mission planning

# Forming a Team

- Two lead authors recognized the need for a white paper on this topic, made decision to write one collaboratively, and wrote the bulk of it
- At time of submission, decided that we needed the intellectual support of broader representation from the Mars science community
  - Approached small number of community leaders representing Mars science in general (Carr, Mustard), astrobiology and search for life (Amend, Nealson, Summons), and programmatic/mission development (McCleese)
- Is there value in having a long list of co-authors or signatories?
  - Having a lot of signatories could indicate strong community support for a given idea
  - NASEM and current co-chairs of the planetary decadal have made clear that there is not – value of the white paper comes from (i) the strength of the ideas, and (ii) maybe the first few co-authors' names
  - Despite this, the planetary community currently appears to believe there is real value in having a long list of co-authors or supporters, and some white papers are accumulating lists of many tens of co-signers to show wide support.

# Developing a White Paper

- Outline of ideas, developed in discussion between the two lead authors
  - The ideas had been developed within the community over the preceding decade, so it was straightforward to put them all together into a single, coherent argument
  - It helped that the two of us both had broad Mars-science backgrounds that allowed us to discuss concepts that spanned the entire range of Mars science
- Fleshed out in powerpoint (essentially a very-detailed outline), converted to prose for submission
- Written by two people (to make it manageable), then solicited co-signers at time of submission from a *small* number of additional people

# Key Points

Summary (based on our experience; your activity may be different):

- Identify concept that you feel is important (whether narrow, specific science, mission concepts, or programmatic objectives); don't feel obligated to pick a "big" idea
- Enlist small group of people to write it, so that it is manageable and has a consistent voice and a logical intellectual flow (rather than reading as if it were written by committee)
- Consider whether to have a *small* number of additional signatories
- At least in planetary, white papers are only ~7 pages; if the ideas are there, it can be written relatively quickly – no need to drag it out

*Two additional fundamental points:*

- *White papers are extremely important – they are the way to ensure that the full breadth of ideas and the best ideas are considered for the decadal strategy.*
- *Recognize that, by submitting to the decadal strategy process, you may be giving up ownership of the ideas; if they move forward, you likely will have to compete via proposal to participate in or lead an effort. Remember that you're doing this for the benefit of the entire community.*