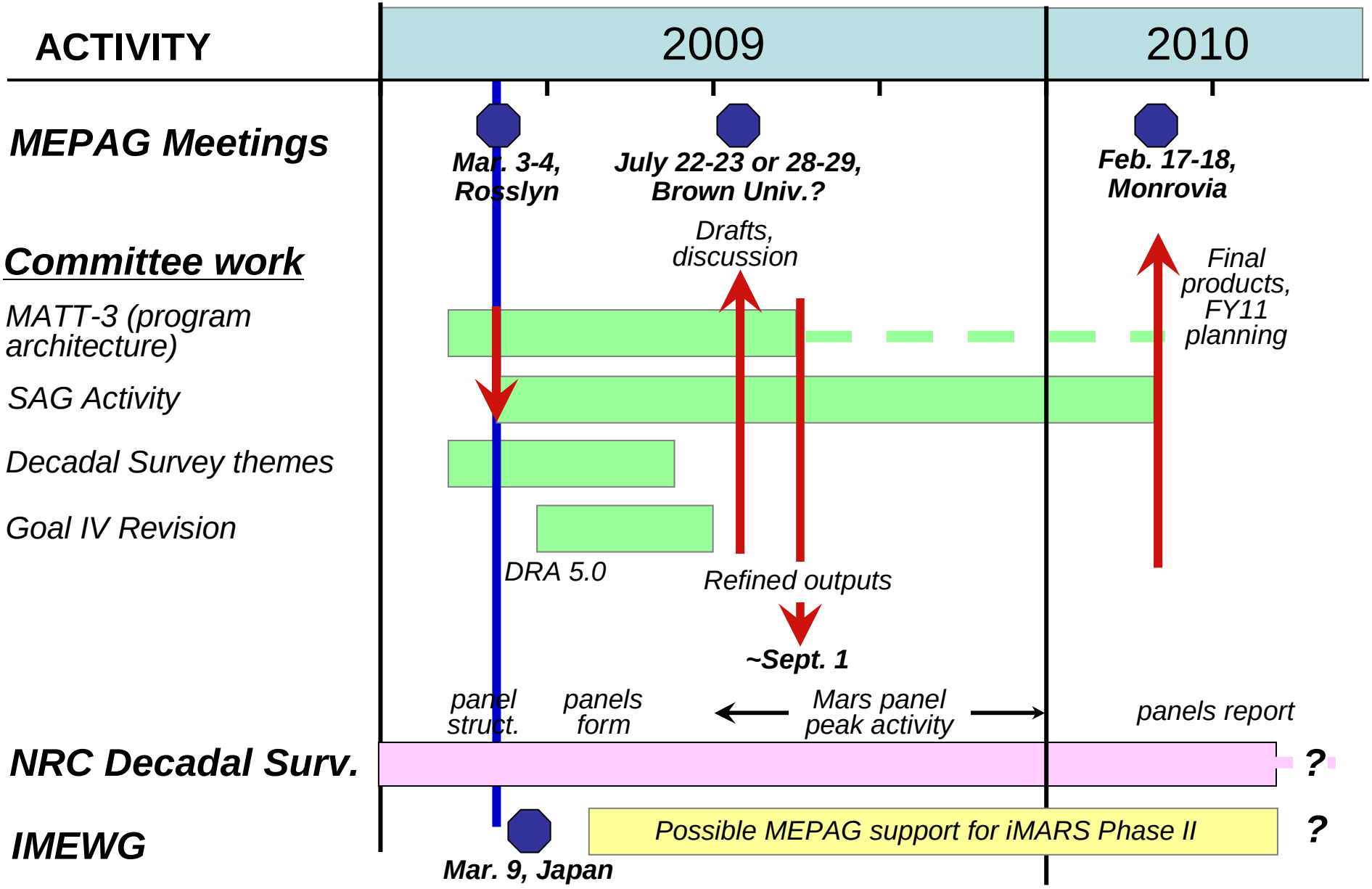
Mars Exploration Program Analysis Group (MEPAG)

chartered by NASA HQ to assist in planning the scientific exploration of Mars

MEPAG: Action Items, Forward Planning

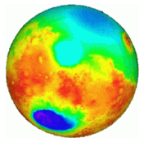
Jack Mustard, *MEPAG Chair*

MEPAG Planning, 2009



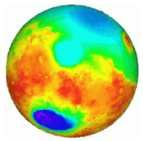
MATT-3

- Refine MATT-3's draft report of 03-03-09 based on MEPAG's discussion
- Consider the consequences of MSO-lite instead of MSO in the context of the long-range architecture choices. These consequences include:
  - Loss of follow-on of HiRISE-class imaging for site certification
  - Possible loss of meter-scale imaging for change detection
  - Reduced telecom capability or duration
  - Further reduction to MSO-min jeopardizes the ability to identify potential localized trace gas sources
- Consider how best to prepare for the selection of future landing sites
  - What are the implications if follow-on high-resolution imaging is not available from MSO-lite?
  - Should a landing site selection process be established now to best utilize the existing missions for the future program?
- Preliminary analysis needed by July, 2009, draft white paper by 09-01-09.



Mars Climate Modelling SAG

- Prepare a white paper defining the strategic needs for a Mars climate modelling capability, and possible implementation approaches.
- Charter to be prepared by Meyer and Zurek



2016

Consensus position?

- Cooperation with ESA on ExoMars…
- Decade-scale infrastructure
  - Telecommunications
  - Site certification capability for landing (ground and atmospheric)
- Trace gas science—variations in time and space.
- _____
- Surface science

- Route further questions to MATT-3

Mid-Range Rover SAG (1 of 2)

- Recommendation A-1 of MATT-3
- Possible assumptions (Draft)
  - The mission includes a single rover. Functional attributes: solar-powered, targeting accuracy of 3 km semi-major landing ellipse, rover range at least 5 km to enable exploration outside of the landing ellipse, lifetime > 1 Earth year, no requirement to be able to visit a PP Special Region
  - This is a dual-purpose mission: 1) conduct high priority in-situ science, 2) prepare for MSR.
  - The rover will have the capability to prepare a cache of samples that meet the standards of quality described by ND-SAG and that could potentially be recovered by MSR.
  - The preliminary cost cap for the mission is about $1.3B (to be confirmed).

Mid-Range Rover SAG (2 of 2)

- Possible Requested Tasks (Draft)
  - Evaluate the possible and probable discoveries from MSL and ExoMars that would feed forward to 2018.
  - Based on the above, the MEPAG Goals Document, and recent reports from the NRC, analyze the kinds of high-priority science that could be accomplished with this mission concept. Propose draft statements of scientific objective.
  - Determine the most important ways in which this mission could contribute to a future MSR. The assembly of a cache is assumed, but are there other ways in which this mission could prepare for MSR?
  - Given the possibility that the 2018 sample cache could be returned by a MSR, a mission with significant planetary-protection constraints, analyze the possible planetary protection requirements for different kinds of landing sites and operational scenarios.
  - Considering the science that this mission may accomplish, in what technologies should investments be made to maximize the mission capabilities?
  - In cooperation with the Advanced Studies engineering team, evaluate possible refinements to the mission engineering and/or operational scenario that would increase the mission's value, consistent with the given approximate cost cap.
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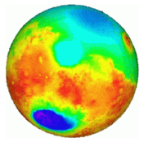


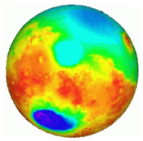
Vertical Mobility SAG?

- Recommendation A-2 of MATT-3
- Requested Tasks (Draft)
  - Determine whether a vertical mobility mission concept should be defined for prioritization consideration in future Mars architecture efforts.
  - What is the minimum science that would need to be accomplished in this mission?
  - What kind of advance information would be needed to select the site for this mission?
- Preliminary analysis needed by July, 2009, draft white paper by 09-01-09.

Goal IV Update

Possible process

- Form a small committee under leadership of Darlene Lim and Abhi Tripathy
  - Somebody with expertise in granular materials (IVA-1C and 6).
  - At least one atmospheric scientist (IVA-1B, 3, and dust storms).
  - One biohazard or planetary protection expert (IVA-1C and 4).
  - A geologist experienced in the distribution and phases of water (IVA-1D).
  - Somebody with expertise in human toxicology.
  - A radiation expert.
  - A couple of at-large general purpose scientists.
  - A few engineers for Objective IVB.
- Provide them with DRA5.0, carefully consider the Goal IV descriptions, propose updates as needed.
- Report back to MEPAG by July, 2009 meeting.



Summary of Volunteers Needed

- Mars Climate Modeling SAG
- Mid-range rover SAG
- Vertical mobility SAG
- Goal IV update

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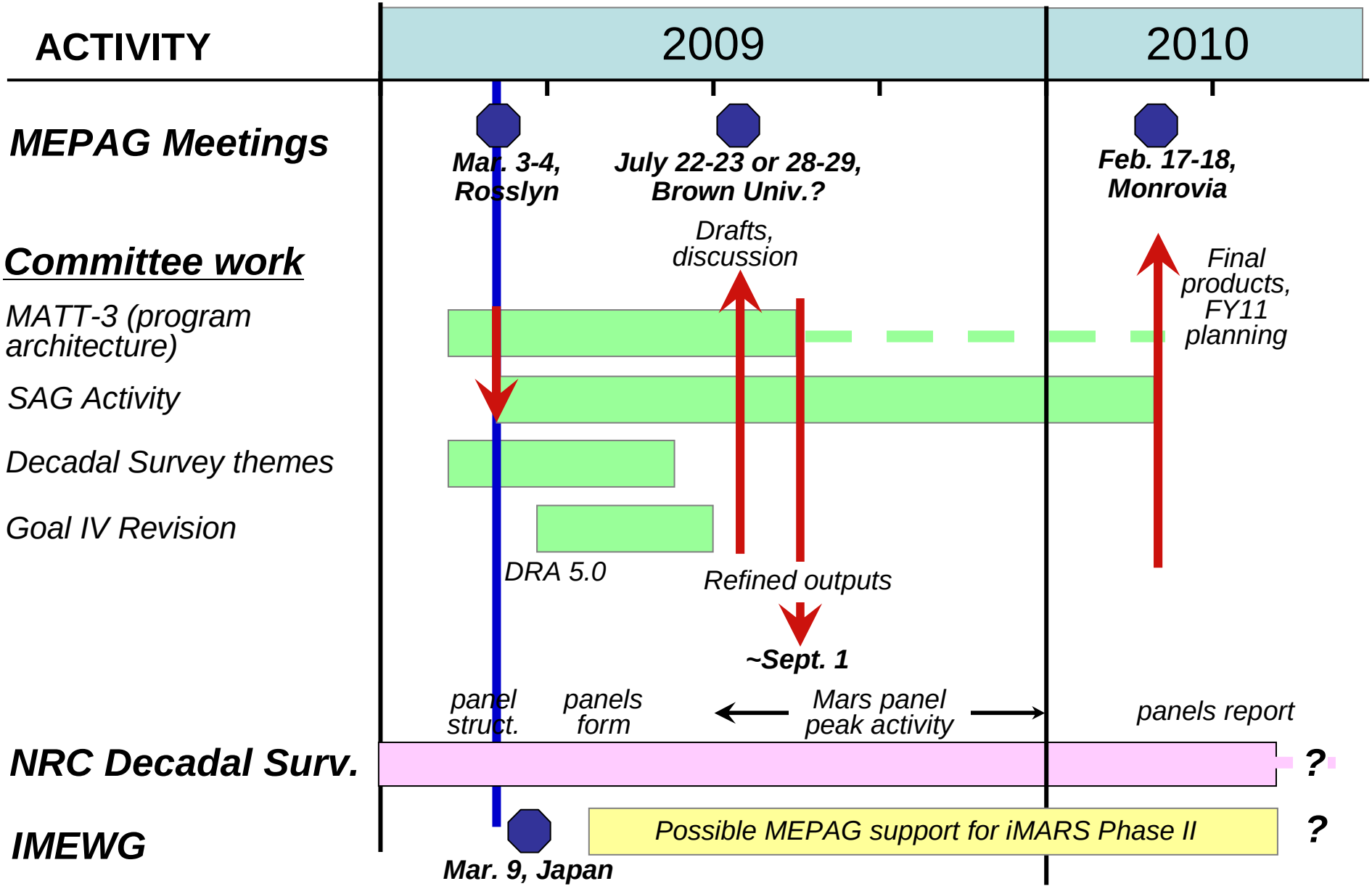

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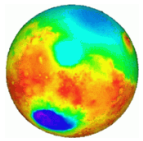

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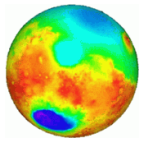

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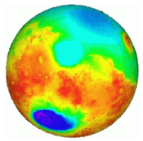

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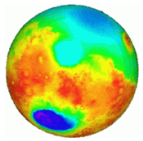

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