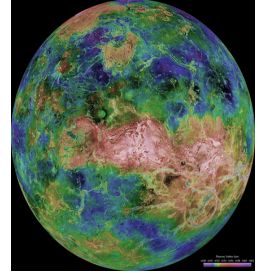
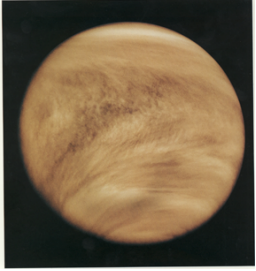


VEXAG

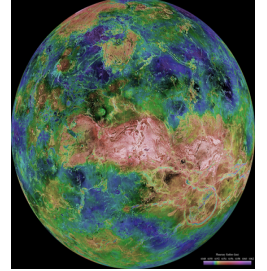
Venus Exploration Roadmap



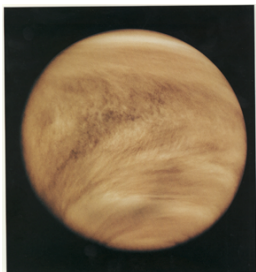
- Goal: *Develop a long-range plan for Venus exploration, using the suggested roadmap in the Decadal Study as a starting point. Incorporate technology development needs and plans into the roadmap as appropriate*
- Issue: Since the Decadal was completed, new budget realities and changes in emphasis necessitate a reanalysis of the exploration roadmap that had been proposed for Venus in that document.
- Members: Ellen Stofan (chair), Sushil Atreya, Bruce Campbell, Marty Gilmore, Lori Glaze, David Grinspoon, Tibor Kremic, Sanjay Limaye, Ralph Lorenz, Sue Smrekar, Doug Stetson, Hakan Svedhem



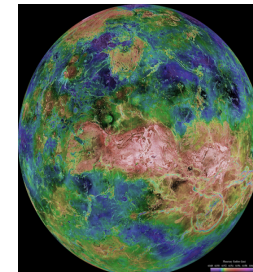
Venus Exploration Roadmap Schedule



- First meeting – March 11, 2013
- March-May, 2013- seek input from community via VEXAG website and PEN announcement
- April, June, 2013- Telecons to review input and coordinate with technology group
- October, 2013- Finalize proposal for discussion at November VEXAG
- November, 2013- review at VEXAG meeting
- December, 2013: Final inclusion into website

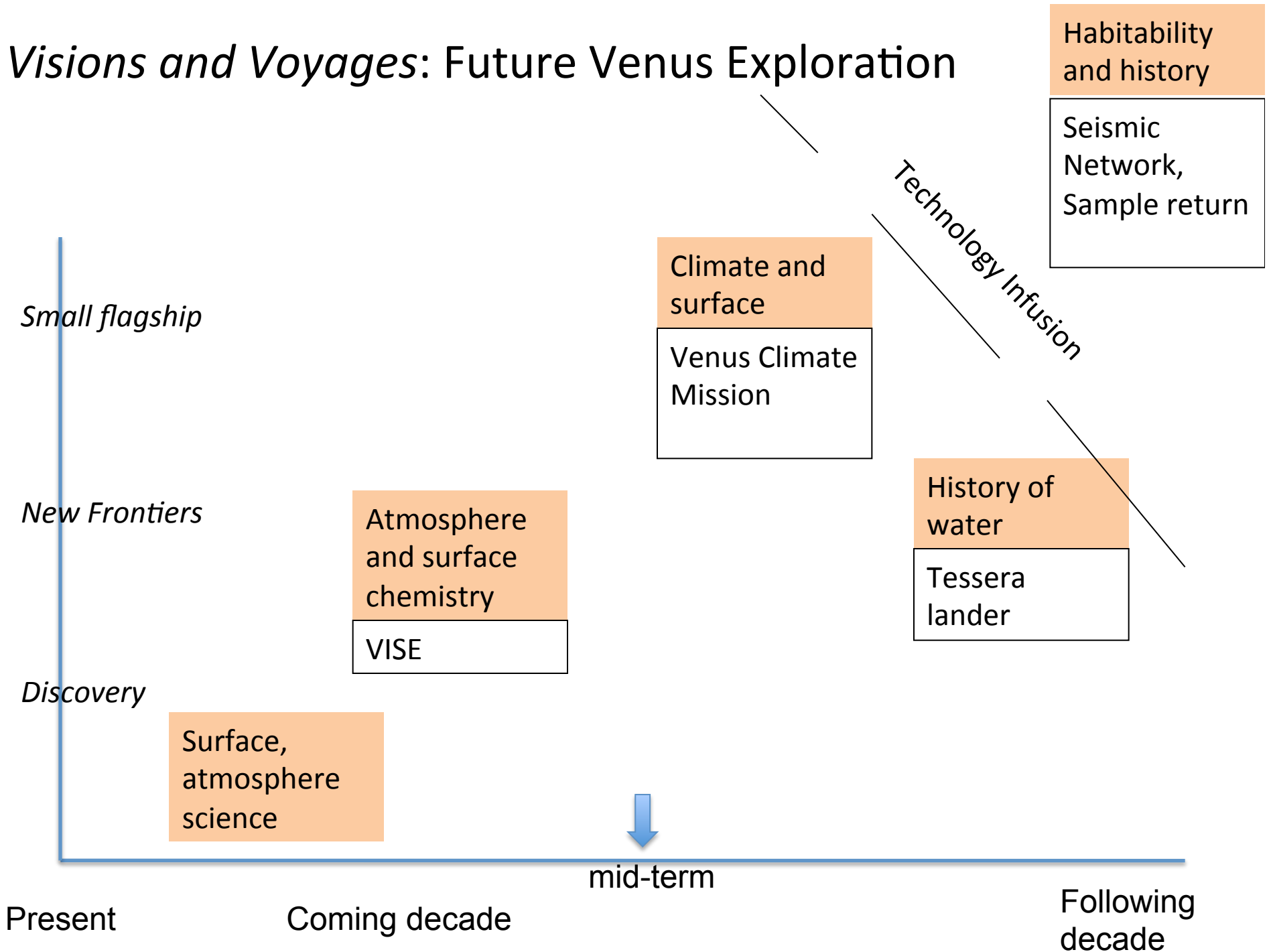


Process



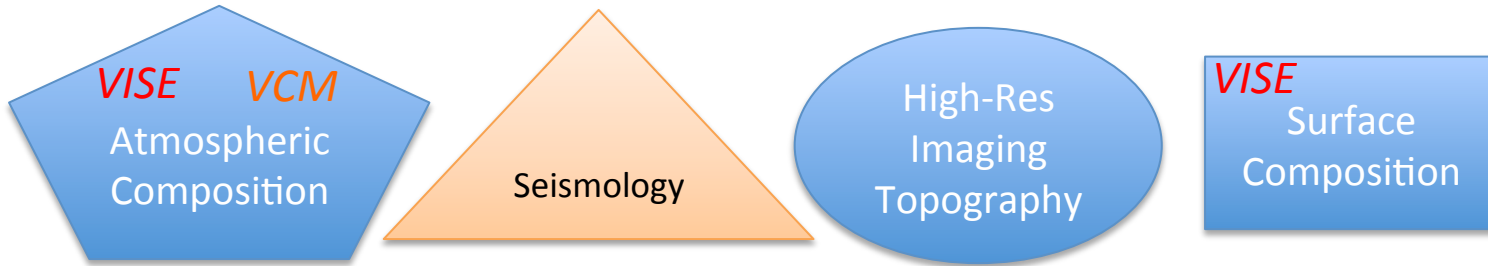
- The decadal roadmap focused on mission recommendations, particularly at the New Frontiers class level and above
- Our group is focusing on using the VEXAG Goals-Objectives-Investigations document to map out priority measurements
- Measurements can often be addressed/ accomplished by multiple means— for example, surface composition by remote sensing and/or by *in situ* measurements at different locations

Visions and Voyages: Future Venus Exploration

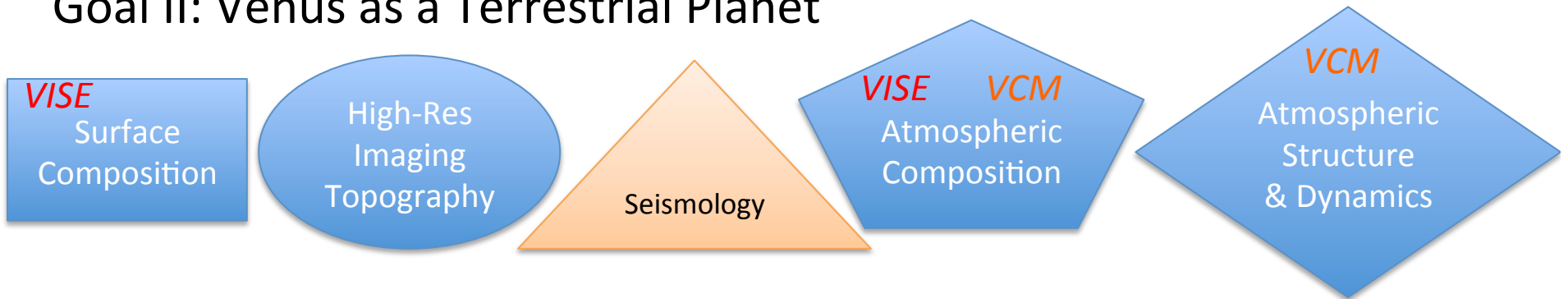


VEXAG Goal /Measurement Priorities

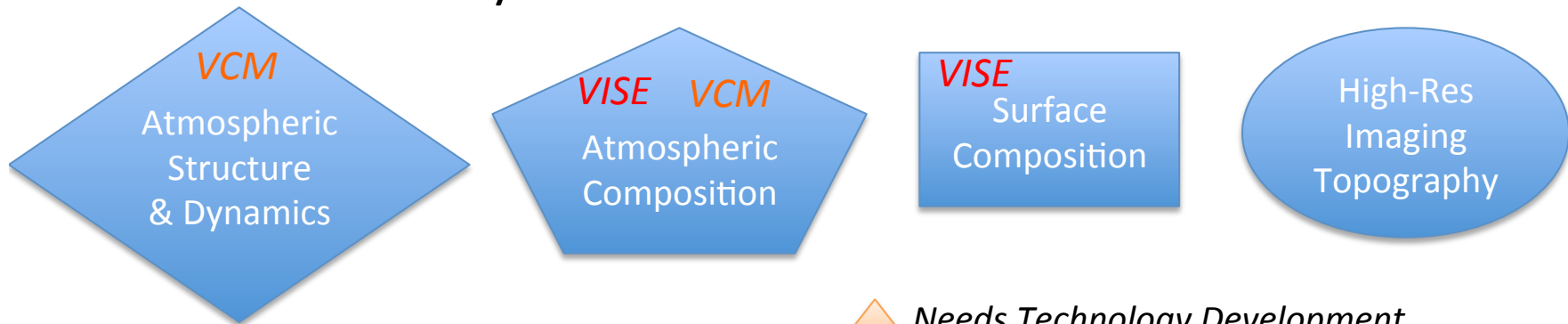
Goal I: Origin and Evolution




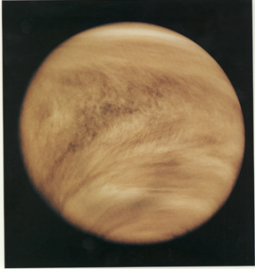
Goal II: Venus as a Terrestrial Planet



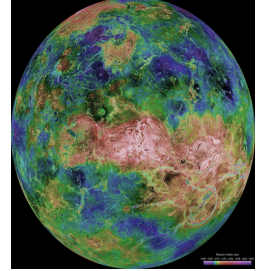
Goal 3: Habitability and Climate Evolution



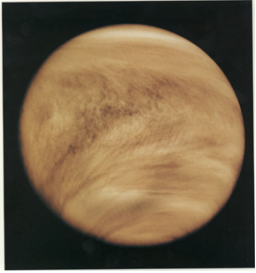
 *Needs Technology Development*



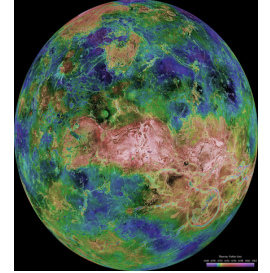
Roadmap Strategy



- This mapping illustrates that multiple high priority measurements can be accomplished by a single mission (e.g., VCM, VISE) or captured by possibly lower cost missions focused on a single objective (for example--atmospheric noble gas and stable isotopes or high-resolution topography)
- Our strategy will be to create sample roadmaps for each measurement objective
- This mapping clearly demonstrates that there is a specific suite of interdisciplinary measurements that address the three critical goals to investigate why Earth's twin is so different
- Technology development is enabling for seismology missions, but is also enhancing in areas such as EDL, instrument development, etc. (cf. Technology Briefing held on Monday)



Myths about Venus Exploration



- Exploring Venus requires technologies that are too far out in the future
 - *False: Highly capable missions are possible now*
- Flagship quality science can only come from Venus surface, and requires mobility
 - *False: Great science can be done from orbit, landers, atmospheric entry probes and atmospheric balloons now*
- The cost and risks of Venus missions are too high
 - *False: Venus missions are cost-and risk- competitive with other missions*
- We can understand the big questions about the Solar System without going to Venus
 - *False: Understanding how and when Venus lost its oceans is of primary concern in understanding the origin and evolution of life and Venus's divergent path from Earth, including its climate, are key to understanding earth-like exoplanets.*