WSDS Panel Discussion
Statistics and Data Science at JPL

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National Aeronautics and
Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

- ▶ NASA's lead center for the robotic exploration of space

- ▶ the first NASA center, and the only NASA FFRDC (operated by Caltech)

- ▶ a place where virtually everyone uses data science and statistics

- ▶ full of amazing problems that need to be solved, and a rich source of new research problems

- ▶ infused with the ethos of "Dare Mighty Things"

- ▶ open to (almost) anyone who wants to contribute, either via employment or collaboration

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A little about me

- I am a Principal Statistician and Technical Group Lead for Statistical Methods and Applications.

- BA in Economics, Swarthmore College in 1982; worked 1983–1990 worked in litigation support consulting.

- Ph.D. in Statistics, 1999, and MA in Math, 1992, from UCLA.

- Started working at JPL as a grad student in 1997.

- Research interests:
  - massive data set analysis for remote sensing data
  - uncertainty quantification and statistical modeling/machine learning
  - spatial and spatio-temporal statistics
  - evaluation of climate models by comparison with observations
  - decision making under uncertainty for complex systems

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- ▶ Uncertainty quantification for remote sensing "retrieval" algorithms for Orbiting Carbon Observatory-2, Microwave Limb Sounder, and the Atmospheric Infrared Sounder (Earth Science)

- ▶ Spatial-statistical Data Fusion for the Atmospheric Infrared Sounder and the Cross-track Infrared Scanner (Earth Science)

- ▶ UQ-aware Machine Learning for Uncertainty Quantification (Research)

- ▶ Experimental design for Mars Sample Return (Planetary Science/Engineering)

- ▶ Sea-level Rise Guidance System (NASA "Applications")

- ▶ Europa Clipper science requirements analysis (Planetary Science/Engineering)

- ▶ Virtual Information Fabric Infrastructure (Complex systems)

Third most important: advocate for the use of rigorous statistical and data science methods across the Lab and NASA; bridging the gap between theory and applications.

Second most important: establish are core capability at JPL in statistical methodology for solving new problems involving new types of data.

Most important: collaborate with universities to identify promising future JPL-ers in statistics and data science, hire and mentor them from post-doc on through their careers.

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Acknowledgments