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Doing physics on the nearest planet, or the next one over

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Spaceflight produces a steady supply of physics problems. Recent research at the Kennedy Space Applied Physics Laboratory includes topics as diverse as the active shielding of cosmic radiation, the cratering of Martian soil by landing rockets, re-entry physics, and numerous imaging and detection techniques. Even something as simple as extracting water from a space shuttle thermal tile requires new thinking about physics. Often a concept must be formulated, developed and delivered to operational status within just a year or two, and so it helps to have a broad understanding of nature. My own career began in systems engineering for the Space Shuttle navigation systems and slowly developed into full-time research specializing in theoretical statistical mechanics. The key to making this transition was to identify some problems that would need to be solved and then to position myself as someone who could solve them. That strategy, along with a lot of patience and sincere effort, has allowed me to move into a very satisfying career as a full-time scientist. I hope to share some of the excitement of doing physics in the space program and where it is headed, both on Earth and on Mars, and how you might use the same strategy to create a physics career on your own nearest planet.