

NASA's Search for Habitable Environments and Life: The Role of Laboratory Astrophysics

Charles Beichman*

February 3, 2006

Abstract

Ongoing and future NASA astronomy missions need detailed information on the properties of a wide variety of molecular species and dust grains to convert observations into physical understanding. Examples include dust in protostellar disks around young stars and debris disks around mature disks; macro-molecules (PAHs) in nearby star forming regions and in distant galaxies; signatures of prebiotic chemistry in molecular clouds and comets; and biomarkers indicative of habitable environments and life itself in the atmospheres of nearby planets. NASA telescopes such as Spitzer, JWST, and the Terrestrial Planet Finder (TPF) will address these and many other scientific questions. A solid grounding in laboratory astrophysics is essential to addressing the goals of these scientific investigations.

*Michelson Science Center, California Inst. of Technology, Jet Propulsion Laboratory