

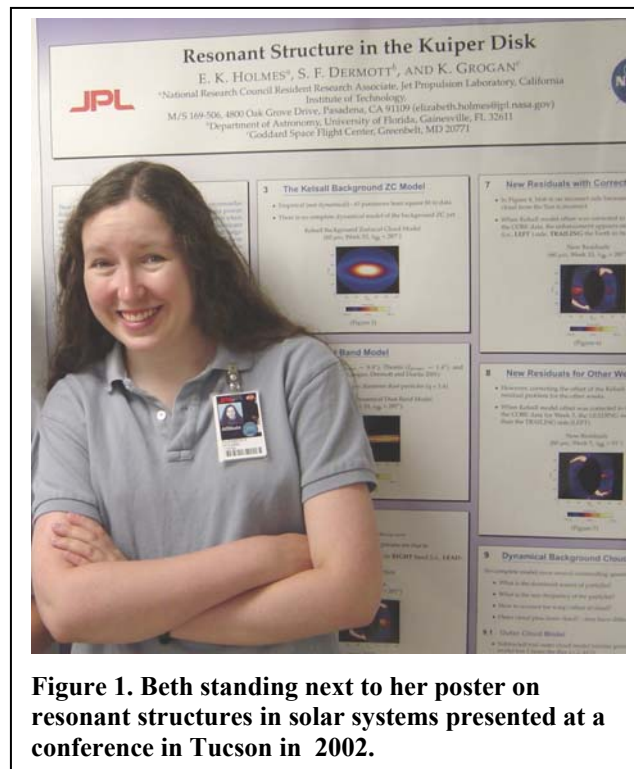
ELIZABETH KATHERINE HOLMES 1973-2004

Elizabeth (Beth) K. Holmes died suddenly in Pasadena on March, 23, 2004, from unexpected effects of a long-standing heart condition. She was 30 years old. At the moment of her passing, she was at her computer comparing her theoretical models on the effects of planets on the distribution of zodiacal dust with some of the first observations from the Spitzer Space Telescope.

Born on June 24, 1973, Beth was the only child of James and Barbara Holmes. Undeterred by numerous treatments and operations to correct a congenital heart condition, Beth developed an interest in math and physics leading to her graduation from MIT in 1995 with a bachelors degree in Physics. She entered the University of Florida shortly afterwards to begin her Ph.D studies under the direction of Professor Stanley Dermott. Beth was particularly interested in the dynamics of interplanetary dust, and initially worked on secular perturbations of the zodiacal cloud: how the planets impose warping of the cloud, and how they can force the center of the cloud to be offset from the Sun.

Despite the fact that Beth was primarily a theorist, she was keen to include some observing experience in her Ph.D education. She recently completed an observing program with Harold Butner at the Steward and Palomar Observatories looking for submillimeter and mid-infrared emission around nearby main-sequence stars - a signpost of planetary formation. The results were published last year in the *Astronomical Journal*. Beth's Ph.D thesis work, some results of which were recently published in the *Astrophysical Journal*, focused on dust originating in the Kuiper belt, and how some of this dust is expected to be spatially structured due to resonant interactions with Neptune. This phenomenon may be quite common in other planetary systems, with recent images of Epsilon Eridani perhaps providing a prime example of a Kuiper disk analog.

After graduating from Florida in 2002, Beth took up a National Research Council postdoctoral position at the Jet Propulsion Laboratory with Dr. Charles Beichman and Dr. T. Velusamy with the goal of applying her theoretical knowledge of zodiacal clouds to observations from the Spitzer Space telescope. In advance of the launch of Spitzer, Beth gathered detailed information on over 150 solar type stars and carefully planned a



Spitzer observing program to detect faint zodiacal signals. While waiting through numerous launch delays, she prepared models of zodiacal clouds influenced by the presence of planets to be ready when Spitzer images of stars like Vega, Upsilon Andromedae, and Fomalhaut became available. These models were presented as talks and posters at a number of conferences. Her models were a critical part of the Early Release Observations of Fomalhaut and the subsequent Spitzer paper on the possibility that a Jovian-mass planet located approximately 40 AU from the star was responsible for the structures seen in the Fomalhaut disk. The Fomalhaut paper in the special Spitzer edition of the *Astrophysical Journal* is dedicated to Beth's memory.

Beth was an enthusiastic and cheerful colleague who made friends everywhere she worked. In addition to developing friendships and collaborations at JPL, she became a valued member of the Spitzer/MIPS instrument team at the University of Arizona. She was active on the Committee on the Status of Women in Astronomy of the American Astronomical Society, publishing an article on "The Postdoc Perspective on the Women in Astronomy II Conference" in the January 2004 issue of *STATUS*, the CSWA magazine, and serving as an associate editor of that magazine. She was an inspiring role model for young women in science, befriending and mentoring a number of Caltech women undergraduates, as well as making numerous appearances in K-12 classrooms for science outreach. She pursued her love of plants (cactus in particular), cats and fish, spending her spare time lovingly tending her small garden.

Her friends and colleagues will remember Beth for her scientific contributions, but also for her courage as we realize that she worked beside us completely unshadowed by the heart condition that would take her in so sudden and untimely a manner. We take solace in the knowledge that at the moment of her passing, she was pursuing her passion for astronomy, working among colleagues who valued her work and her friendship, that she had a supportive and loving family with parents on the East Coast and close relatives on the West Coast, and that in her fiancé, Todd Rope, she had found a kindred spirit.

Dr. Charles Beichman
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