

Dr. Björn J. R. Davidsson

Relevant experience

Determining masses and bulk densities of comet nuclei through nongravitational force modeling; Thermophysical modeling of comets and asteroids; Direct Simulation Monte Carlo (DSMC) modeling of comet comae; Discrete Dipole Approximation (DDA) modeling of light scattering; radiative transfer in solid particulate media; tidal breakup mechanics. Co-Investigator and Lead Scientist for Sweden of the OSIRIS camera system on the ESA spacecraft Rosetta. Member of the JPL MIRO team (Microwave Instrument for the Rosetta Orbiter).

Education

1994-1998: Master of Science (Major in Physics), Uppsala University (UU), Sweden.

1998-2003: PhD in Theoretical Astrophysics, UU, Sweden.

Employment history

May 2003 – Apr 2005: Research Fellow, ESA/ESTEC, Noordwijk, The Netherlands

Sep 2005 – Feb 2010: Research Associate, Dept. of Physics and Astronomy, UU, Sweden

Oct 2008 – Apr 2009: Visiting Scientist, Jet Propulsion Laboratory, Pasadena (CA), USA

Mar 2010 – Mar 2016: Researcher, Dept. of Physics and Astronomy, UU, Sweden

Mar 2016 – present: Scientist IV, group 3224, Jet Propulsion Laboratory, Pasadena (CA), USA

Awards

2002: *Paul Pellas – Graham Ryder Award* for 2001 (The Planetary Division of the Geological Society of America / The Meteoritical Society)

2003: Naming of *Asteroid (11798) Davidsson*

2009: *The Edlund Prize* (The Royal Swedish Academy of Sciences)

2011: *NASA Group Achievement Award* to MIRO Flight Operations Team

Publications and Reviews

94 publications in refereed journals, 18 as first author (4 as single author). h-index 28.

Selected Publications

Davidsson, B. J. R., Sierks, H., Güttler, C., Marzari, F., Pajola, M., Rickman, H., A'Hearn, M. F., Auger, A.-T., El-Maarry, M. R., Fornasier, S., Gutierrez, P. J., Keller, H. U., Massironi, M., Snodgrass, C., Vincent, J.-B., and 33 colleagues (2016). The primordial nucleus of comet 67P/Churyumov-Gerasimenko. *Astron. Astrophys.* 592, A63.

Sierks H., C. Barbieri, P. L. Lamy, R. Rodrigo, D. Koschny, H. Rickman, H. U. Keller, J. Agarwal, M. F. A'Hearn, F. Angrilli, A.-T. Auger, M. A. Barucci, J.-L. Bertaux, I. Bertini, S. Besse, D. Bodewits, C. Capanna, G. Cremonese, V. Da Deppo, B. Davidsson and 46 colleagues (2015). On the nucleus structure and activity of comet 67P/Churyumov-Gerasimenko. *Science* 347, aaa1044.

Davidsson, B. J. R., and 46 colleagues (2015). Orbital elements of the material surrounding comet 67P/Churyumov-Gerasimenko. *Astron. Astrophys.* 583, A16.

Davidsson, B. J. R., H. Rickman, J. L. Bandfield, O. Groussin, P. J. Gutierrez, M. Wilska, M. T. Capria, J. P. Emery, J. Helbert, L. Jorda, A. Maturilli, T. G. Mueller (2015). Interpretation of thermal emission. I. The effect of roughness for spatially resolved atmosphereless bodies. *Icarus* 252, 1-21.

- Davidsson, B. J. R., and H. Rickman (2014). Surface roughness and three-dimensional heat conduction in thermophysical models. *Icarus* 243, 58-77.
- Davidsson, B. J. R., P. J. Gutierrez, O. Groussin, M. F. A'Hearn, T. Farnham, L. M. Feaga, M. S. Kelley, K. P. Klaasen, F. Merlin, S. Protopapa, H. Rickman, J. M. Sunshine, P. C. Thomas (2013). Thermal inertia and surface roughness of comet 9P/Tempel 1. *Icarus* 224, 154-171.
- Davidsson, B. J. R., S. Gulkis, C. Alexander, P. von Allmen, L. Kamp, S. Lee (2010). Gas kinetics and dust dynamics in low-density comet comae. *Icarus* 210, 455-471.
- Gutierrez, P.J., and B. J. R. Davidsson (2007). Non-gravitational force modeling of Comet 81P/Wild 2. II. Rotational evolution. *Icarus* 191, 651-664.
- Davidsson, B. J. R., and P. J. Gutierrez (2006). Non-gravitational force modeling of comet 81P/Wild 2. I. A nucleus bulk density estimate. *Icarus* 180, 224-242.
- Blum, J. R. Schräpler, B. J. R. Davidsson, J. M. Trigo-Rodriguez (2006). The physics of protoplanetary dust agglomerates. I. Mechanical properties and relations to primitive bodies in the Solar System. *Astrophys. J.* 652, 1768-1781.
- Davidsson, B. J. R., and P. J. Gutierrez (2005). Nucleus properties of comet 67P/Churyumov-Gerasimenko estimated from non-gravitational force modeling. *Icarus* 176, 453-477.
- Davidsson, B. J. R., and P. J. Gutierrez (2004). Estimating the nucleus density of comet 19P/Borrelly. *Icarus* 168, 392-408.
- Davidsson, B. J. R., and Y. V. Skorov (2002). On the light-absorbing surface layer of cometary nuclei. II. Thermal modeling. *Icarus* 159, 239-258.
- Davidsson, B. J. R., and Y. V. Skorov (2002). On the light-absorbing surface layer of cometary nuclei. I. Radiative transfer. *Icarus* 156, 223-248.
- Davidsson, B. J. R. (2001). Tidal splitting and rotational breakup of solid biaxial ellipsoids. *Icarus* 149, 375-383.
- Davidsson, B. J. R. (1999). Tidal splitting and rotational breakup of solid spheres. *Icarus* 142, 525-535.