Technische Universität Braunschweig

IGEP TU Braunschweig Institut für Geophysik und extraterrestrische Physik

Part time researcher / graduate student position in

Dust emission from main-belt comets

Temporary Position (contract of 4 years), Salary Level TV-L E13, 75%

The Institute for Geophysics and extraterrestrial Physics of the Technische Universität Braunschweig is looking to fill a researcher position (Entgeltgruppe E 13, m/w/d) as part of Prof. Dr. Jessica Agarwal's research group. The earliest starting date for this position will be on 01 March 2021. The position is limited to a period of four years.

The position will offer the possibility to work towards obtaining a doctoral degree from the Technische Universität Braunschweig and to acquire teaching experience at a low level (up to 10% FTE). For the latter, knowledge of German will be a strong advantage. The applicant is expected to carry out research on the following project:

Main-belt comets (MBCs) are small solar system bodies that have the orbits of asteroids and at least temporarily emit dust to interplanetary space in a manner similar to comets. The first such object, 133P/Elst-Pizarro, was discovered in 1996, and the number of known MBCs has increased particularly during the last decade. The direct cause of dust emission from MBCs is suspected to be the sublimation of water ice from near-surface layers, although direct evidence is lacking because the associated column density of vapour would be too low to be detectable by current telescopes. Since water ice cannot survive on asteroid surfaces for timescales compared to their orbital lifetimes, the sub-surface ice would have likely been uncovered by a trigger process such as a collision or rotational instability.

This project aims to better understand dust emission from main-belt comets, in turn, to understand the present-day water content in the asteroid belt. The candidate will use a huge collection of archival observational data of known MBCs to physically characterize activity behavior of individual objects. The candidate will also develop a tool to simulate the distribution of dust near MBCs as a consequence of its motion under the influence of solar gravity and radiation pressure that will be compared to observations.

In addition, the candidate will exploit archival data to study the shape and rotation state of MBCs (e.g. 133P/Elst-Pizarro), as fast rotation is suspected to both trigger sublimation in the first place and to support gas drag in lifting dust against gravity.

Applicants should hold a masters degree in a relevant field, and combine dedication to scientific work, curiosity and the ability to work in a self-organised way. Good command of written and spoken English is required. Experience with programming and/or photometric data analysis can be an advantage.

The Institute for Geophysics and extraterrestrial Physics offers an active and interdisciplinary scientific environment with an open and collaborative atmosphere. Key research areas include Laboratory Astrophysics, Planet Formation, Space Physics, Applied Geophysics, and Small Body Astronomy and Exploration.

Applications should include a short description of previous research, curriculum vitae including publications if applicable, proposed starting date and the contact information of two potential referees. Applications should be sent by email as a single pdf file to Jessica Agarwal (j.agarwal@tu-braunschweig.de). Review of applications will begin on 04 January 2021 and continue until the position is filled. Remuneration is according to the German public salary scale TVL group E13 (75%). Social security benefits are in accordance with the public service regulations.

The TU Braunschweig aims to increase the number of women in science and technology. Women are therefore strongly urged to apply, as are qualified handicapped applicants. Applications are welcome from all nationalities. Please note that personal data and documents related to the application process will be stored electronically, and that application costs cannot be refunded.

Full contact information:
Prof. Dr. Jessica Agarwal
Institute for Geophysics and extraterrestrial Physics
Technische Universität Braunschweig
Mendelssohnstr. 3
D-38106 Braunschweig
Phone: +49 531 391 5249