



Call for a PhD position
Applications are open now

Cluster of Excellence
OUR DYNAMIC UNIVERSE
<https://dynaverse.astro.uni-koeln.de>

Observational and theoretical studies of interstellar shocks

Prof. Dr. Peter Schilke
Supervisor

Project:

In this project, targeted observations with instruments like ALMA, NOEMA, JWST, etc., will be conducted and archive mining to increase the number of available data sets will be used. To constrain shock properties, a statistically comparison of the observations with synthetic emission line cubes will be conducted. The emission line cubes are produced by post-processing the shock simulations with radiative transfer tools, first with an existing 1D shock code, later with a 3D MHD code developed in Cologne. We will first concentrate on molecular outflows from protostars.

Contact:

Universität zu Köln
Mathematisch-
Naturwissenschaftliche Fakultät
I. Physikalisches Institut
Zülpicher Str. 77
50937 Köln

Goals:

Shocks in the ISM have been observed in outflows, cloud–cloud collisions and in molecular clouds exposed to expanding supernova remnants. Both the chemistry and the molecular line excitation have been studied, but only integrated properties (temperatures, column densities) have typically been examined. No self-consistent 3D simulations that reproduce line shapes exist, and there is little study of the impact of shocks on molecular cloud evolution. We would like to improve on that.

✉ schilke@ph1.uni-koeln.de

Requirements:

- Solid foundation in physics and astrophysics
- Scientific writing skills

Desirable experience:

- Programming, e.g., in the python language
- Telescope data analysis
- Interferometry
- Statistical analysis

Offer:

Please use the contact information or the website
<https://blog.mpifr-bonn.mpg.de/imprs/> for more details.

Dynaverse welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.