



Call for a PhD position
Applications are open now

FDS Tomography: Feeding protoplanetary Discs from Streamers

Project:

The initial steps in this project require the definition and initial analysis of a baseline observational dataset of target sources. In parallel, simulations will be post-processed to provide a full suite of synthetic observations, which will ultimately enable the derivation of the probabilistic interpretation of the structure and flow within star forming regions. This will require the establishment of a workflow to post-process existing simulations and the development of ML systems to exploit these synthetic observations.

Goals:

The goal of this project is to constrain the temporal, spatial, and velocity structure of the streamers which feed the central regions and circumstellar disks of forming massive protostars. Most state-of-the-art studies of the mass flow in molecular clouds focus on either the plane-of-the-sky velocity to trace the gas motions or on using simple models applied to self-absorbed spectral lines to constrain the line-of-sight inflow velocities. However, no existing study of accretion streamers has used comparisons of observations with MHD simulations to exploit the full 3D velocity field to constrain the flow. This project will develop and exploit new analysis techniques to harness the coupled power of extensive, rich, spectral line observations and state-of-the-art MHD simulations to provide astrophysical tomographic reconstructions of streamer mass flows across a range of evolutionary star formation stages and environments.

Requirements:

- A strong background in physics and astrophysics.
- Excellent English written and spoken communication skills.
- A willingness to explore novel data analysis techniques.
- The ability to work as part of an international collaboration
- Good programming and software skills and significant experience with Linux and Python.

Desirable experience:

- Experience with ML/AI methods
- Experience with radiative transfer modelling
- Experience working with observational spectral line data from radio telescopes and/or synthetic observations

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.

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

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