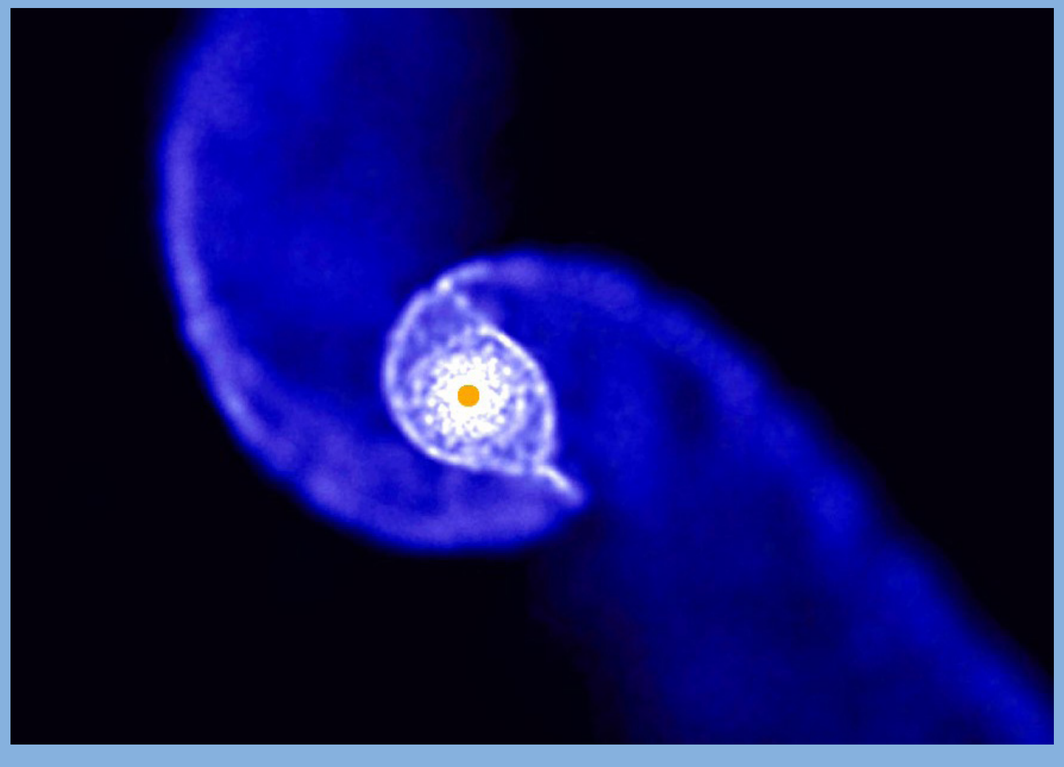
JÜLICH Forschungszentrum | JÜLICH SUPERCOMPUTING CENTRE

SIMULATION AND DATA LABORATORY ASTRONOMY AND ASTROPHYSICS

THE UNIVERSE ON HPC SYSTEMS



- **Exascaling of astro simulation codes**
- **Research and training in advanced astro simulation techniques**
- **Transfer of HPC know-how to astro community**
- **Data science applications in big data environment of large surveys**

Research

The SDL Astronomy and Astrophysics specializes in galactic astrophysics with an emphasis on star and planet formation. In particular it investigates the dynamics of young star clusters and the formation of planets from protoplanetary discs. Many recent findings in the context of exoplanets and the outskirts of our solar system require the development of new concept and their testing by simulation codes and data science application to observations.

Simulation Support

One major aims is to support the astrophyisical community in fulfilling the FAIR principles also for astrophysics simulations. This means making software and data findability, accessibility, interoperability, and reusability (FAIR). In a recent survey, we ask researchers in Germany about their code usage and data policies. Based on the survey results, we currently develop new stratigies for FAIR astrophysics simulations.

Data Science meets Simulation

In the last decade due to the advent of many large surveys astronomy has increasingly become a subject that is data science driven. One of our core aims, to bridge the gap between data science and simulations in astronomy to easy the comparison of result in order to maximize scientifc value. We are currently developing new standards and tools in this context.

Data Science Support

The research centre Jülich hosts a LOFAR station on its grounds and provides extensive data storage for the LOFAR community. In this context data science applications have become increasingly important. As a new service potential users can now also apply for computer time for data science projects.

LOFAR-Station DE605

Cooperations

We are part of the the PUNCH4NFDI consortium, the Big Bang to Big Data (B3D), which is a profil project of NRW, and and the SFB 1601 „Habitats of Massive Stars across cosmic time“.

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