# HANS-PAUL FREDERICK BAEHR

July 2018

## BASIC INFORMATION

Citizenship: USA
Language: native English, conversational German
Current position: PhD candidate, Theory of Planet and Star Formation Group, MPIA, Heidelberg, Germany
Supervisor: Prof. Dr. Hubert Klahr

## CONTACT

Work Contact:
Max-Planck-Institut für Astronomie
Königstuhl 17
D-69117 Heidelberg, Germany
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## EDUCATION

*In Progress:*
Doctorate, Physics - September 2018
*Thesis: Nucleated Versus Spontaneous Planet Formation in Self-Gravitating Disks*
Ruprecht-Karls University, Heidelberg, Germany
Max Planck Institute for Astronomy, Heidelberg, Germany

Master of Science, Physics - March 20, 2015
*Thesis: Conditions for Planet Formation via Gravitational Instability of Self-Gravitating Disks*
Ruprecht-Karls University, Heidelberg, Germany
Max Planck Institute for Astronomy, Heidelberg, Germany

Bachelor of Science, Physics - May 4, 2012
Bachelor of Science, Mathematics - May 4, 2012
University of Utah, Salt Lake City, Utah, United States

High School Diploma – May 30, 2007
International Baccalaureate Diploma
West High School, Salt Lake City, Utah, United States

## EMPLOYMENT HISTORY

PhD Candidate, Theory of Planet and Star Formation Group, MPI for Astronomy, Heidelberg
*Thesis: Nucleated Versus Spontaneous Planet Formation in Self-Gravitating Disks*
Supervisor: Prof. Dr. Hubert Klahr
September 2015 – September 2018

Student Assistant, Theory of Planet and Star Formation Group, MPI for Astronomy, Heidelberg

Responsibilities: Code Development and Documentation
April 2015 – August 2015

Masters Student, Theory of Planet and Star Formation Group, MPI for Astronomy, Heidelberg
*Thesis: Conditions for Planet Formation via Gravitational Instability of Self-Gravitating Disks*
Supervisor: Prof. Dr. Hubert Klahr
March 2014 – March 2015

Undergraduate Research Assistant, Robert Marc Laboratory, University of Utah
June 2007 – April 2008

## FIRST AUTHOR PUBLICATIONS

**Baehr H.**, Klahr H., 2015, *The Role of the Cooling Prescription in Disk Fragmentation: Numerical Convergence & the Critical Cooling Parameter in Self-Gravitating Disks*, ApJ, 814, 155

**Baehr H.**, Klahr H., Kratter K. M., 2017, *The Fragmentation Criteria in Local Vertically Stratified Self-Gravitating Disk Simulations*, ApJ, 848, 40

## INVITED TALKS

*Gravitational Instability in the Planet Formation Paradigm*
University of Tübingen Astrophysicalisches Colloquium; Tübingen, Germany, November 14, 2016

*Modeling Planet Formation in Young Self-Gravitating Disks*
Formation and Dynamical Evolution of Exoplanets; Aspen, Colorado, USA; March 31, 2017

*Self-Gravitating Disks and Planet Formation*
2017 MIAPP: Protoplanetary Disks and Planet Formation and Evolution; Munich, Germany; May 29, 2017

*Gravitational Instabilities as a Planet Formation Scenario*
Blackboard Colloquium; Institute for Theoretical Astrophysics, Heidelberg, Germany, December 4, 2017

## GRANTS/PROPOSALS

Proposal for the Extension of Computing Time with the Jülich Supercomputing Centre: JUQUEEN
Title: *Gravoturbulent Planetesimal Formation*
Principal Investigator: Dr. Hubert Klahr
First renewal: **46 million** cou-hours; May 1, 2016 – April 30, 2017
Second renewal: **36 million** cpu-hours; May 1, 2017 – April 30, 2018

Application for Computing Time with the Jülich Supercomputing Centre: JUWELS
Title: *Gravoturbulent Planetesimal Formation*
PI: Dr. Hubert Klahr
Period: **2.7 million** cpu-hours; May 1, 2018 – April 30, 2019

Contributor to DFG Proposal *Characterization of Disk-Fragmentation Objects: Brown Dwarfs or Planets?*
PIs: Dr. Hubert Klahr and Dr. Wilhelm Kley
Status: re-submitted

Contributor to ALMA Proposal *Witnessing Giant Planet Formation in the Act*
PI: Dr. Richard Teague
Status: submitted for ALMA Cycle 5

## COMPUTER SKILLS

Word processing with Microsoft Office and LaTeX. Coding with Python, IDL, C++ and FORTRAN.

Several years of experience using finite difference, (magneto)hydrodynamic codes including PENCIL, PLUTO and RAMSES.

Experience using the Theo, Isaac, and Hydra clusters hosted by the Max Planck Gesellschaft at Max Planck computing and Data Facility in Garching and the JUQUEEN cluster hosted by the Jülich Supercomputing Center

## TEACHING EXPERIENCE

Teaching Assistant, *Practical Course in Numerical Methods*
February 8 – February 19, 2016

Assisted in the supervision of the following students:

Bhavya Joshi, June 2017 – August 2018
Master's thesis on the implementation of new methods in an adaptive mesh code

Dominic Batzler, October 2017 – July 2018
Bachelor's thesis on the behavior and evolution of solids in 2D local fragmentation simulations

## ORGANISATIONAL ROLES

Organizer (Lodging, transportation, food, schedule)
2018 MPIA/ITA Join Retreat on Theory of Planet and Star Formation; Todtnauberg, Germany
March 6-8, 2018

## OTHER RESPONSIBILITIES

Refereed for MNRAS

## RESEARCH INTERESTS

Planet Formation
Circumstellar/Protoplanetary Disks

Self-Gravitating Systems
Hydrodynamic Simulations

## PERSONAL INTERESTS

Football (both of them), basketball, ultimate Frisbee, cycling, skiing, and drawing, among other activities

## REFERENCES

Prof. Dr. Hubert Klahr
Max-Planck-Institute for Astronomy, Heidelberg, Germany
klahr@mpia.de