NEIGE FRANKEL

Max-Planck Institue for Astronomy Heidelberg, Germany, frankel@mpia.de
Current position: 3rd year Graduate student

EDUCATION

PhD Astrophysics, IMPRS Heidelberg, Germany — Expected 2020/21
MSc degree of Astrophysics, Lund University, Sweden *(passed with distinction)* — 2017
BSc degree of Physics, Université Paul Sabatier, Toulouse, France *(passed with distinction)* — 2015

RESEARCH

Forward Modelling the Secular Evolution of the Milky Way Disk 2017-21
PhD thesis, IMPRS Heidelberg. Advisor: Prof. Hans-Walter Rix

Data from spectroscopic surveys of stars and the Gaia space mission now can determine the distributions of stellar orbits, ages, and composition across our Milky Way, constraining its long-term dynamical evolution. However, astrophysical conclusions require the development and implementation of stringent forward-models for these large data sets of $10^4 - 10^6$ stars, accounting e.g. for measurement uncertainties and selection effects. For my thesis I have set-up and successfully applied such a machinery, revealing strong orbit evolution across the Galaxy.

Nucleosynthesis in Accretion Disks Around Black Holes 2016-17
Master thesis, Lund University, Sweden. Advisor: Prof. Melvyn B. Davies

For my MSc thesis, I investigated whether accretion disks around black holes could contribute to the synthesis of elements. Nuclear fusion requires extreme conditions of temperature and density, and these conditions are only provided by very few systems. To investigate such systems in details, I have implemented an implicit integration scheme to solve the stiff differential equations involved in a network of nuclear reactions, and applied it to systems of accretions disks around black holes.

Optimum Scheduling for Transit Timing Variations (TTV) Measurements Jun – Aug 2016
Summer Research Student, Lund University, Sweden. Advisor: Dr. Alexander J. Mustill

The Effect of Binary Stars on the Space-velocity Distribution of Pulsars Jan– May 2015
BSc Internship, Lund University, Sweden. Advisor: Dr. Ross P. Church

GRANTS & SCHOLARSHIPS

IMPRS Scholarship Stipend *(awarded to 2 students at IMPRS)* — 2017
Erasmus grant *(Erasmus agreement Toulouse-Lund created and signed under my initiation)* — 2015
Bourse au Merite (*Award for outstanding grades in Baccalaureate exam)* — 2012

REFEERED PUBLICATIONS

- **1st Author**

  Frankel, Sanders, Ting, Rix (2020), Keeping it Cool: Much Migration, yet Little Heating, in the Galactic Disk, submitted to ApJ

  Frankel, Sanders, Rix, Ting, Ness (2019), The Inside-out Growth of the Galactic Disk, ApJ, 884, 99

  Frankel, Rix, Ting, Ness, Hogg (2018), Measuring Radial Orbit Migration in the Galactic Disk, The Astrophysical Journal, 865, 2, 96.

- **Contributing Author**

  Eilers, Hogg, Rix, **Frankel** &3 (2020), The Strength of the Dynamical Spiral Perturbation in the Galactic Disk, ApJ accepted

  Maire, Molaverdikhani, Desidera, Trifonov, Molliere, D'Orazi, **Frankel** &38 (2020), Orbital and spectral characterization of the benchmark T-type brown dwarf HD 19467B, A&A (accepted)

  Feuillet, **Frankel**, Lind, Frinchaboy, Garcia-Hernandez, Lane, Nitschelm, Roman-Lopez (2019), Spatial variations in the Milky Way disc metallicity-age relation, MNRAS, 489, 2, 1742

TOOLS PUBLICLY AVAILABLE

APOGEE-DR14 selection function with a tutorial of its use with practical examples

TECHNICAL STRENGTHS

Computer Languages	Python (current project), C++ (MSc thesis), Matlab (courses)
Editing/version control	Vim, Gedit, Latex, Gnuplot, git
Codes & Packages used	PyTorch (Articificial neural nets in Python – used in published work)
	`BSE`, `TTVFast` (used in research projects)
	`RADMC`, `Zeltron`, `RAMSES` (1-day training each in Astrosim 2017)

TRAINING, SUMMER SCHOOLS & HANDS-ON WORKSHOPS

Ringberg workshop, Germany – *Machine Learning in Astronomy*	2019
Shanghai, China – *Gaia-LAMOST hack-a-thon*	2018
Heidelberg, Germany – *Gaia data & science summer school*	2018
Flatiron institute, New York, USA – *Gaia Sprint*	2018
Penn-State, USA – *Astrostatistics summer school*	2018
Moletai Observatory, Lithuania – *Europlanet international research summer school*	2017
Ecole Normale Superieure de Lyon, France – *Astrosim: Numerical Astrophysics*	2017
University of Savoie, France – *Particle physics, gravitational waves, CERN*	2016
Universities of Orsay and Saclay, Paris, France – *Astroparticle physics, cosmology*	2015

TALKS & SEMINARS

EAS virtual meeting – *Measuring Radial Migration with Gaia and APOGEE*	2020
Aarhus, virtual seminar – *Seeing the Galactic Disk Evolve with Red Clump Stars*	2020
Birmingham, Stars Group meeting – *What Sets the Radial Structure of the Galactic Disk?*	2020
Cambridge UK, IoA, Galaxy Evolution Discussion Seminar – *Seeing the Milky Way Disk Evolve*	2020
Cambridge UK, IoA, MW meeting – *Modelling the Disk: Dynamics, Chemistry & Supernovae*	2020
Heidelberg, MPIA seminar – *The Dynamical Evolution of the Milky Way Disk is Cool*	2020
Paris Observatory, GEPI seminar – *Seeing the Milky Way Disk Evolve*	2019
Stuttgart AG meeting – *Building a Global Model for the Secular Evolution of the Galactic Disk*	2019
Lund Observatory, whiteboard talk– *Evolution of Galaxy Disks: What the MW Can Do for You*	2019
Kloster Schontal, MPIA retreat– *How to Make a Galaxy Disk in Three Steps: the Milky Way*	2019
Shanghai, The Life and Times of the Milky Way – *Measuring Radial Migration in the MW Disk*	2018
Besancon, APOGEE2 meeting – *Obtained Direct Measure of Radial Migration with APOGEE*	2018
Lund, 'Dynamical Universe for All' – *What Sets the Radial Structure of the Milky Way Disk?*	2018
Heidelberg MPIA, seminar – *What Sets the Radial Structure of the Milky Way Disk?*	2018
Lund University, MSc defence – *Nucleosynthesis in Accretion Disks Around Balck Holes*	2017
Lund Observatory, whiteboard talk – *Optimum Scheduling for TTV Measurements: WASP-47*	2016
Toulouse, BSc Talks– *The Effect of Binarity on the Space-velocity Distribution of Pulsars*	2015

STUDENT SUPERVISION

BSc student Audrey Destarac co-supervised with Hans-Walter Rix 2019
Characterizing observational orbital signatures of black hole – star binaries

TEACHING

Academic teaching / tutoring
Introduction to Astronomy and Astrophysics Tutor, Heidelberg University WS 2019-20

Individual teaching / support / preparation to competitive exams (France)
Physics & Chemistry focused preparation for science baccalaureate (high school, successful) 2014-15
Mathematics weekly support of middle school student in need 2012-15
Physics support for technical baccalaureate (high school) student 2014
Chemistry specific preparation for vocational baccalaureate (high school, successful exam) 2013

PUBLIC OUTREACH

Founder & President of ALVA Student Astronomy Club, Lund University, Sweden 2015-16
Volunteer at Kulturnatten (Culture Night), Lund Observatory, Sweden 2015-16
Vice-president of UPS in Space Student Astronomy Club, Toulouse University, France 2014

COMMUNITY INVOLVEMENT

Administrator in the social media group 'Early Career Astronomers & Astrophysicists' 2019-....
Annual talk promoting scientific studies, High school Lycee Pierre d'Aragon, France 2013-18
Student ambassador in Astronomy, Lund University, Sweden 2016-17
Student volunteer at annual INFOSUP exhibition (choice of study/career) Toulouse, France 2012-14

UNIVERSITY / DEPARTMENTAL SERVICE

LOC Galdark meeting, Heidelberg, Germany 2017
Initiater and organiser at Lund University, Sweden: 2015-16
- Meeting MSc – PhD students: PhD applications, experience and career choices
- Workshop and hacking session with fellow MSc students: *Computing*
- Workshop and hacking session with fellow MSc students: *Statistics*