Andreas Flörs

✉ *afloers@mpa-garching.mpg.de*
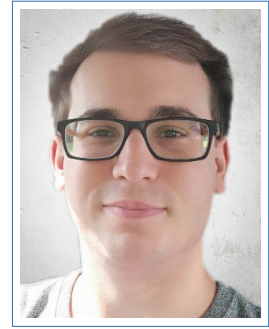⌂ *afloers.github.io*
in *linkedin.com/in/afloers*
◉ *github.com/afloers*
Date of birth: December 08, 1990
Nationality: German

Employment

09/2020 - present **Post-doctoral Research Scientist** *Max-Planck-Institut für Astrophysik, Garching, Germany.*
- Supernova Spectroscopy
- Radiative Transfer
- Statistical Analysis and Modelling
- Supernova Explosion Kinematics
- Atomic Data Aggregation
- Astronomical Data Reduction Pipelines

05/2015 - 08/2015 **Student trainee**, *Chair E62, TU München, Germany*, Developments and improvements of a GEM-TPC detector simulation

Education

The German system recognizes grades from 1.0 (best) to 4.0 (lowest passing grade)

03/2017 - 08/2020 **PhD in Astrophysics** *Max-Planck-Institut für Astrophysik, Garching, Germany.*
Thesis: *The Neutron-Rich Ejecta of Type Ia Supernovae and Constraints on the Exploding Mass of their Progenitors*
Supervisor: Prof. Dr. Wolfgang Hillebrandt
Co-supervisor: Dr. Jason Spyromilio

04/2015 - 02/2017 **M. Sc. degree in Nuclear, Particle and Astrophysics**, *Physics Department, Technische Universität München*, München, Germany.
Thesis: *The Diversity of Nebular Spectra of Type Ia Supernovae*
Supervisor: Prof. Dr. Wolfgang Hillebrandt
Final mark: 1.3

10/2011 - 03/2015 **B. Sc. degree in Physics**, *Physics Department, Technische Universität München*, München, Germany.
Thesis: *Is the Higgs boson THE Higgs boson?*
Supervisor: Prof. Dr. Martin Beneke
Final mark: 1.5

Languages

German	Native	
English	Fluent	*Academic English C1, Hilderstone College, Broadstairs, UK, Mar 2015*
French	Basic	

Scholarships, Awards, Honors and Grants

08/2020 **Kippenhahn prize**, *Best scientific paper written by a student at the Max-Planck Institute for Astrophysics in 2019*, Garching, Germany.

04/2019 **STScI Spring Symposium 2019 travel grant**, *$ 700*

01/2018 **Best poster prize**, *Supernovae - From Simulations to Observations and Nucleosynthetic Fingerprints*, Bad Honnef, Germany.

03/2017 - **ESO studentship programme**: PhD support for two years at the European Organisation for Astronomical Research in the Southern Hemisphere (ESO).
02/2019

10/2011 - **Max Weber-Programm Alumnus**: Implementation of the German National Merit Foundation according to the Bavarian Elite Support Act for highly-gifted students at universities in Bavaria.
present

2011 **Best Abitur Certificate in Bavaria**

Scientific Collaborations

10/2019 - **adH0cc** *Accurate determination of H0 with core-collapse supernovae*; responsible for data reduction, including the development of data reduction pipelines.
present

03/2019 - **TARDIS-SN**; *TARDIS-SN is an open-source Monte Carlo radiative-transfer spectral synthesis code for 1D models of supernova ejecta*; member of the core development team.
present

02/2019 - **Collaboration with Dr. Stuart Sim**; *Determination of the ionization state of iron in thermonuclear supernovae*; Queen's University Belfast, Belfast, UK
05/2019

02/2018 - **ENGRAVE** *Electromagnetic counterparts of gravitational wave sources at the Very Large Telescope*; member of the *'Spectroscopy'* and *'Public Outreach'* groups.
present

03/2017 - **ePESSTO+**, *Public ESO Spectroscopic Survey for Transient Objects*; member of the *'Faint & Fast Transients'* and *'Nearby Thermonculear Supernovae'* research groups.
present

Qualifications, Schools and Workshops

08/2019 **Second Radiative Transfer Code Comparison Workshop**, *Max-Planck-Institut für Astrophysik, Germany*
Analysis and comparison of synthetic supernova spectra computed by 9 different codes.

11/2018 **Neutron Star Merger Training Workshop**, *Bertinoro, Italy*
Data reduction and interpretation for electromagnetic counterparts of gravitational wave events.

10/2018 **Leadership and mentoring training**, *ESO Garching, Germany*
Introduction into delegating tasks, communicating expectations, leading students.

06/2018 **First Radiative Transfer Code Comparison Workshop**, *Weizmann Institute for Science, Israel*
Analysis and comparison of synthetic supernova spectra computed by 9 different codes.

03/2018 **Communication skills training**, *ESO Garching, Germany*
How to give a science talk aimed at different audiences.

05/2017 **First Italian Summer School on Astrostatistics**, *Milan, Italy*
Hands-on workshop on Bayesian statistics, inference and statistical sampling.

| 01/2017 -
06/2017 | **MPA/ESO Radiative Transfer Course**, *Max-Planck-Institut für Astrophysik, Germany* |
| | Basics of radiative transfer theory and numerical methods for solving LTE and non-LTE radiative transfer problems. |

IT

Programming	Python (advanced), C (intermediate)	VCS	git, github
OS	Linux, Windows, Mac	Office	LaTeX, Open/MS/Libre Office

Scientific Community Work

06/2020	**LOC Member of the ESO Conference $H_0 2020$**, ESO Garching, Germany.
04/2020	**TARDIS Core Member**, Michigan State University, USA.
11/2019	**Organization Lead, TARDIS code comparison**, Michigan State University, USA.
08/2019	**LOC Member of the *Second Radiative Transfer Workshop***, Max-Planck-Institut für Astrophysik, Germany.
10/2018	**ESO Observing Programmes Committee Scientific Assistant Period 103**, ESO Garching, Germany.
08/2018	**Co-Organizer of the *Neural Network Hands-on Workshop***, ESO Garching, Germany.
06/2018 - 02/2019	**Co-Organizer of the *Supernova Meeting***, ESO Garching, Germany.
10/2017	**ESO Observing Programmes Committee Scientific Assistant Period 101**, ESO Garching, Germany.
03/2017 - 02/2019	**Organizer ESO Wine & Cheese Seminar**, ESO Garching, Germany.

Mentoring/Teaching:

since 09/2020	**Graduate Student Advisor**, Max-Planck-Institut für Astrophysik, Germany, Géza Csörnyei
since 08/2020	**Undergraduate Student Mentor**, Michigan State University, USA, Isaac Smith
05/2020 - 07/2020	**Google Summer of Code Mentor for the *TARDIS* collaboration**, Michigan State University, USA
since 07/2019	**Undergraduate Student Mentor**, Michigan State University, USA, Ezequiel Pássaro
05/2019 - 07/2019	**Google Summer of Code Mentor for the *Python Foundation***, Michigan State University, USA
06/2017	**Lecturer at the *MPA/ESO Radiative Transfer Course***, Max-Planck-Institut für Astrophysik, Germany
10/2015 - 10/2018	**Teaching Assistant for undergraduate physics classes**, Technische Universität München, Germany: *Theoretical Electrodynamics; Relativity, Particles and Fields; Advanced Nuclear, Particle and Astrophysics; Extragalactic Astrophysics*

Public Outreach

09/2020	**TARDIS Highschool Program Instructor**, Michigan State University, USA. *Teaching scientific programming and supernova physics to highschool pupils.*
2018, 2019	**Presenter for the *European Researcher's Night***, ESO Supernova, Garching, Germany. *Supernovae for laypeople.*
07/2018	**Lunar Eclipse Event**, ESO Supernova, Garching, Germany. *Telesope assistence and public talks.*
2018 - present	**Presenter at the ESO Supernova**, ESO Supernova, Garching, Germany. *Planetarium shows, exhibition and premises tours, public talks.*
2016 - 2018	**ESO Open House Day**, ESO Garching, Germany. *Comet building for children.*

Publications

10/2020	refereed: 10 — first author 2 — citations 1804 — h-index 7

Refereed first author papers:

2020	**Flörs, A.**, Spyromilio, J., Taubenberger, S., et al. *Sub-Chandrasekhar progenitors favoured for type Ia supernovae: Evidence from late-time spectroscopy*, MNRAS, 491, 2902, 2020 (arXiv:1909.11055)
2018	**Flörs, A.**, Spyromilio, J., Maguire, K., et al. *Limits on stable iron in Type Ia supernovae from near-infrared spectroscopy*, A&A, 620, A200, 2018 (arXiv:1810.10781)

Refereed collaboration papers:

2019	Pastorello, A., (+17 additional authors), **Flörs, A.**, et al. *The evolution of luminous red nova AT 2017jfs in NGC 4470*, A&A, 625, L8, (arXiv:1906.00811)
2017	Abbot et al., *Multi-messenger Observations of a Binary Neutron Star Merger*, ApJL, 848, L12, 2017 (arXiv:1710.05833)
2017	Smartt, S. J., Chen, T.-W., Jerkstrand, A., et al. *A kilonova as the electromagnetic counterpart to a gravitational-wave source*, Nature, 551, 75, 2017 (arXiv:1710.05841)

Refereed papers with major contribution:

2020	Prentice, S., (+1 additional author), **Flörs, A.**, et al. *The rise and fall of an extraordinary Ca-rich transient – The discovery of ATLAS19dqr/SN 2019bkc*, A&A, 635, A186, 2020 (arXiv:1909.05567)
2019	McBrien, O., (+12 additional authors), **Flörs, A.**, et al. *SN2018kzr: a rapidly declining transient from the destruction of a white dwarf*, ApJL, 885, L23, 2019 (arXiv:1909.04545)
2019	Taubenberger, S., **Flörs, A.**, et al. *SN 2012dn from early to late times: 09dc-like supernovae reassessed*, MNRAS, 488, 5473, 2019 (arXiv:1907.06753)
2018	De Cia, A., (+8 additional authors), **Flörs, A.**, et al. *Light curves of hydrogen-poor Superluminous Supernovae from the Palomar Transient Factory*, ApJ, 860, 100, 2018 (arXiv:1708.01623)
2018	Dhawan, S., **Flörs, A.**, Leibundgut, B., et al. *Nebular spectroscopy of SN 2014J: Detection of stable nickel in near infrared spectra*, A&A, 619, A102, 2018 (arXiv:1805.02420)

Software:

2020	Kerzendorf, W., Sim, S. A., Vogl, C., et al. *tardis-sn/tardis: TARDIS v3.0.dev3527*, Zenodo, 2020

2020   Prochaska, J. X., Hennawi, J., Cooke, R., et al. *pypeit/PypeIt: Release 1.2.0*, Zenodo, 2020

▬▬ List of Seminars and Talks

Conference contributions: **5 contributed talks** and 1 poster presentation.
Seminars and colloquia: **2 invited seminars**, 9 contributed talks.
Workshops: 5 contributed talks.

10/2020	Informal Discussion, ESO Garching, Germany, seminar talk: *"How to model a supernova"*
02/2020	Supernova Meeting, ESO Garching, Germany, seminar talk: *"Solar abundance of manganese: a case for near-Chandrasekhar-mass Type Ia supernova progenitors"*
01/2020	Institute Seminar, Max-Planck Institute für Astrophysik, Garching, Germany, seminar talk: *"Constraining SN Ia explosion models from nebular phase spectroscopy"*
10/2019	Supernova Meeting, ESO Garching, Germany, seminar talk: *"Observational evidence for high neutronization in supernova remnants: implications for type Ia supernova progenitors"*
09/2019	The Extragalactic Explosive Universe, ESO Garching, Germany, **contributed talk:** *"Sub-Chandrasekhar mass progenitors favoured for SNe Ia: Evidence from late-time spectroscopy"*
08/2019	Second Radiative Transfer Workshop, Max-Planck Institute für Astrophysik, Garching, Germany, workshop contribution: *"Baysian inference of the progenitor systems of SNe Ia"*
04/2019	STScI Spring Symposium, Space Telescope Science Institute, Baltimore, USA, **contributed talk:** *"Constraints on the progenitors of normal SNe Ia from nebular phase spectroscopy"*
04/2019	Stars & Exoplanets Meeting, Flatiron Center for Computational Astrophysics, USA, **invited seminar talk:** *"Developing a likelihood function for supernova modelling"*
04/2019	Transient Meeting, Center for Cosmology and Particle Physics NYU, USA, seminar talk: *"SNe Ia - a one-parameter family of explosions"*
04/2019	Supernova Meeting, ESO Garching, Germany, seminar talk: *"Hα emission in the nebular spectrum of the Type Ia supernova ASASSN-18tb"*
03/2019	Nuclear Astrophysics, Ringberg Castle, Germany, **contributed talk:** *"The evolution of temperature and density in the iron-rich ejecta of SNe Ia in the nebular phase"*
02/2019	Queen's University Belfast Astronomy Colloquium, Belfast, UK, **invited seminar talk:** *"Constraining SN Ia explosion models from nebular phase spectroscopy"*
12/2018	Heidelberg Workshop on Supernovae, Heidelberg, Germany, workshop contribution: *"The origin of iron in SNe Ia: stable nickel"*
09/2018	Supernova Meeting, ESO Garching, Germany, seminar talk: *"Surface Radioactivity or Interactions? Multiple Origins of Early-excess Type Ia Supernovae and Associated Subclasses"*
06/2018	First Radiative Transfer Workshop, Weizmann Institute of Science, Israel, workshop contribution: *"The one-zone model and its application to nebular modelling of type Ia SNe"*
05/2018	Supernova Meeting, ESO Garching, Germany, seminar talk: *"Using late-time optical and near-infrared spectra to constrain Type Ia supernova explosion properties"*
01/2018	From Simulations to Observations and Nucleosynthetic Fingerprints, Bad Honnef, Germany, poster contribution: *"Limits on stable iron in type Ia SNe from late-time IR spectroscopy"*
12/2017	Heidelberg Workshop on Supernovae, Heidelberg, Germany, workshop contribution: *"Bayesian modelling of nebular phase observations of SNe Ia"*
10/2017	Queen's University Belfast Astronomy Colloquium, Belfast, UK, **contributed talk:** *"Nebular Infrared Spectroscopy of Type Ia SNe"*
06/2017	Supernova Meeting, ESO Garching, Germany, seminar talk: *"Supersymmetric model for triggering supernova Ia in isolated white dwarfs"*
12/2016	Würzburg Workshop on Supernovae, Würzburg, Germany, workshop contribution: *"Evolution of line shifts and widths in SN Ia nebular spectra"*
03/2016	Nuclear Astrophysics, Ringberg Castle, Germany, **contributed talk:** *"Modelling of optical nebular phase spectra of SNe Ia"*