

CAROLINE BERTEMES

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RESEARCH INTERESTS

Galaxy Evolution - Stellar populations and star formation histories, ISM phases and links to galactic properties, galaxy structure and kinematics; **Active Galactic Nuclei** - Demographics, accretion, multi-scale structure, connection to host galaxy

EDUCATION AND ACADEMIC EXPERIENCE

Postdoctoral Researcher, University of Heidelberg, DE 11/2020-present

Member of the GALENA group lead by Dr. Dominika Wylezalek
at Astronomisches Rechen-Institut, Zentrum für Astronomie Heidelberg

PhD in Astrophysics, University of Bath, UK 11/2016-10/2020

Thesis: "Weighing star-forming galaxies, component by component"
(Supervisor: Prof. Dr. Stijn Wuyts)

Master in Physics, ETH Zürich, Switzerland 2014-2016

MSc Thesis in collaboration with the Harvard-Smithsonian CfA: "Where are the SMBHs hiding? : Broad line (non-)detection of ultramassive, slowly spinning BHs"
(Supervisors: Dr. Benny Trakhtenbrot, Prof. Dr. Kevin Schawinski, Dr. Martin Elvis) *Spring 2016*

Bachelor in Physics, ETH Zürich, Switzerland 2010-2014

PEER-REVIEWED FIRST-AUTHOR PUBLICATIONS

- **Bertemes C.**, Wuyts S., submitted to MNRAS
Scatter in the star-forming Main Sequence: The link to long-term star formation histories in SDSS-IV MaNGA galaxies
- **Bertemes C.**, Wylezalek D., Albán M., Aravena M., Baker W.M., Cazzoli S., Cicone C., Martín S., Schimek A., Wagg J., Wang W., 2023, MNRAS, 518, 5500
MASCOT: molecular gas depletion times and metallicity gradients - evidence for feedback in quenching active galaxies
- **Bertemes C.**, Wuyts S., Lutz D., Förster Schreiber N.M., Genzel R., Minchin R.F., Mundell C.G., Rosario D., Saintonge A., Tacconi L., 2018, MNRAS, 478, 1442
Cross-calibration of CO- vs dust-based gas masses and assessment of the dynamical mass budget in Herschel-SDSS Stripe82 galaxies
- **Bertemes C.**, Trakhtenbrot B., Schawinski K., Done C., Elvis M., 2016, MNRAS, 463, 4041
Testing the completeness of the SDSS colour selection for ultramassive, slowly spinning black holes

TALKS AND WORKSHOPS (SELECTION):

- "Cosmic Dawn with the JWST – Cycle 1 lessons and plans for Cycle 2", Ringberg, Germany 10/2022
A hands-on session with q3dfit, a powerful new PSF deconvolution and spectral analysis package
- "What drives the growth of black holes: a decade of reflection", Reykjavik, Iceland 09/2022
The decline of star formation: Linking molecular gas, outflows & metallicity gradients
- Meeting of the European Astronomical Society (EAS), Valencia, Spain 06/2022
The decline of star formation: Linking molecular gas, outflows & metallicity gradients

- UK talk tour - ICG Portsmouth, University of Bath, Cardiff University, University of Southampton, University College London, KICC Cambridge 06/2022
The decline of star formation: Exploring molecular gas, outflows and the early history of star formation
- "Large-volume spectroscopic analyses of AGN and star-forming galaxies in the era of JWST", STScI Baltimore (online), US 03/2022
The MIR fitting capabilities of q3dfit, a PSF deconvolution and spectral analysis tool in the wake of JWST
- "Young Astronomers on Galactic Nuclei (YAGN)", Copenhagen (online), Denmark 09/2021
MASCOT: The link between molecular gas and radially resolved galaxy properties in SDSS-IV MaNGA
- National Astronomy Meeting (NAM), Bath (online), UK 07/2021
MASCOT: The link between molecular gas and radially resolved galaxy properties in SDSS-IV MaNGA AGN
- "Extragalactic Spectroscopic Surveys: Past, Present and Future of Galaxy Evolution", Santiago, Chile (cancelled due to COVID-19 outbreak) 10/2020
Scatter in the star-forming main sequence: A remnant of long-term variations in stellar mass growth?
- "Birth, life and fate of massive galaxies and their central beating heart", Favignana, Italy 09/2018
CO- vs dust-based gas masses and assessment of the dynamical mass budget
- "Synergy between low and high redshift galaxy evolution studies in the era of JWST and EUCLID", Noordwijk, Netherlands 07/2018
Cross-calibrating CO- and dust-based gas masses while dynamically assessing the mass budget
- "Galaxy Evolution across time", Paris, France 06/2017
Cross-calibrating CO- and dust-based gas masses and their dependence on environment
- High Energy Astrophysics Seminar, Harvard-Smithsonian CfA, Cambridge, US 09/2016
Are we missing ultramassive, slowly spinning Black Holes in the SDSS colour selection?
URL: https://www.youtube.com/channel/UCMFEeX24_lviXNhek5-FFLA

GRANTS

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- University of Bath Alumni Fund Travel Bursary(250 GBP)** 06/2018
Conference: "Birth, life and fate of massive galaxies and their central beating heart", Italy, Sept 3-7 2018 (complementary to the RAS grant below)
 - ESA travel support from conference organisers (200 Euro)** 05/2018
Conference: "Synergy between low and high redshift galaxy evolution studies in the era of JWST and EUCLID ", Netherlands, July 2018
 - RAS grant (240 GBP)** 04/2018
Conference: "Birth, life and fate of massive galaxies and their central beating heart", Italy, Sept 3-7 2018
 - Santander Postgraduate Mobility Award (950 GBP)** 06/2017
2-week working visit to the MPE in Garching near Munich (Germany)

OBSERVING PROPOSALS

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- "Deep grism spectroscopy of the complex environment around an extremely red quasar within an ultramassive host at $z=3$ ", PI, submitted for JWST Cycle 2 01/2023
 - "The interplay between H₂, HI, dust and metals: calibrating a recipe to study the environmental impact on gas properties of galaxies", Co-I (PI: Dr. Stijn Wuyts), ~24 hours allocated on Arecibo 03/2017

TEACHING AND MENTORING

- Bachelor thesis supervision - Simon Flesch (HeidelbergU): "The link between star formation histories and galaxy morphologies" Autumn 2022
- Summer project supervision - Wenjun Chang (USTC): "FUEL - Cold gas properties of 10k nearby galaxies: the relation to galaxy structure" Summer 2019
- Master thesis supervision - Emily Hunt & Morris Stranger (UBath): "Inference of photometric galaxy redshifts with a mixture density neural network" Summer 2018
- Teaching assistant for the courses: Introduction to Astrophysics, Waves/Oscillations/Optics, Computational Labs (Python) Spring 2017-11/2018
- Peer mentor under the University of Bath's scheme for 1st year students 10/2017-2019

OUTREACH

- Workshop on black holes at the Girls' Day Germany April 2021, 2022
Co-leading a workshop for 5th/6th graders, designing a crafting activity (model of an Active Galactic Nucleus), participating in a Meet & Greet with physicists
- Science activities at the WOMAD festival with the Institute of Physics 27-28/07/2019
Guiding drop-in workshops, designing a "Spot the habitable planet" activity
- Leading science activities on light in rotation format in local primary schools 11/2016-09/2018
Participated in 10 events, each time guiding one of 5 workshops for 2 hours
PI: Dr. Ventsislav Valev; Sponsors: Royal Society, STFC, Thorlabs, Zeiss

SERVICE

- Referee for *The Astrophysical Journal* 01/2019-now
- Developer of the public q3dfit python package for deconvolution and spectral analysis 01/2019-now
- Organiser of the "Cake in the Garden" meetings at ARI Heidelberg 2021-now
- Organiser and chair of the PhD/Postdoc Research Lunches in Bath 11/2018-2019
- Member of the Staff/Student Liaison Committee (Faculty of Science in Bath) 11/2017-2020
- Co-organisator of the Bath-Bristol-Exeter-Cardiff student seminars (BBECss): Conference for astrophysics PhD students from the GW4 institutions 01/2017-2020
- Member of the Juno / Athena SWAN committee for gender equality (Physics Department of the University of Bath) 11/2016-2019

SKILLS

Languages	<i>Native:</i> Luxembourgish; <i>Fluent:</i> English, French, German
Programming	<i>Proficient:</i> Python, L ^A T _E X, bash, SQL, HTML; <i>Intermediate:</i> C++
Software	<i>Proficient:</i> GILDAS-CLASS, Prospector, BAGPIPES, CLOUDY; <i>Basic:</i> XSPEC
Technical experience	Bayesian statistics with MCMC, spectral analysis (optical + far-IR / radio), Open-MPI parallel processing, sbatch & SLURM queued HPC computing, Collaborative coding via GitHub
Observational experience	Carrying out remote co-observations with the ARO (> 100h), data reduction of CO spectra

REFERENCES

Available upon request