

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"
(Supervisors: Dr. Stijn Wuyts, Prof. Dr. Carole Mundell)

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

BSc Thesis: "Comparison of Cosmological Boltzmann Codes" (Supervisor: Prof. Dr. Alexandre Refregier) 2014

PEER-REVIEWED PUBLICATIONS

- Chang W., Wuyts S., **Bertemes C.**, Avery C., et al., in prep (copy available on request)
FUEL: cold gas properties of 10k nearby galaxies - the relation to galaxy structure
- Avery C., Wuyts S., Förster Schreiber N., Villforth C., **Bertemes C.**, Chang W., Hamer S., Toshikawa J., Zhang J., in prep (submitted to MNRAS)
Incidence, scaling relations and physical conditions of ionised gas outflows in MaNGA
- Bhat H., Chakravorty S., Sengupta D., Elvis M., Datta S., Roy N., **Bertemes C.**, Ferland G., Ezhikode S.H., MNRAS, 497, 2992
Hypermassive black holes have faint broad and narrow emission lines
- Pognan Q., Trakhtenbrot B., Sbarrato T., Schawinski K., **Bertemes C.**, 2019, MNRAS, 492, 4058
Searching for Super-Eddington Quasars using a Photon Trapping Accretion Disc Model
- Villforth C., Herbst H., Hamann F., Hamilton T., **Bertemes C.**, Efthymiadou A., Hewlett T., 2019, MNRAS, 483, 2441
The host galaxies of FeLoBAL quasars at $z \sim 0.9$ are not dominated by recent major mergers
- **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):

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| ○ “Cosmic Dawn with the JWST – Cycle 1 lessons and plans for Cycle 2”, Ringberg, Germany
<i>A hands-on session with q3dfit, a powerful new PSF deconvolution and spectral analysis package</i> | 10/2022 |
| ○ “What drives the growth of black holes: a decade of reflection”, Reykjavik, Iceland
<i>The decline of star formation: Linking molecular gas, outflows & metallicity gradients</i> | 09/2022 |
| ○ Meeting of the European Astronomical Society (EAS), Valencia, Spain
<i>The decline of star formation: Linking molecular gas, outflows & metallicity gradients</i> | 06/2022 |
| ○ UK talk tour - ICG Portsmouth, University of Bath, Cardiff University, University of Southampton, University College London, KICC Cambridge
<i>The decline of star formation: Exploring molecular gas, outflows and the early history of star formation</i> | 06/2022 |
| ○ “Large-volume spectroscopic analyses of AGN and star-forming galaxies in the era of JWST”, STScI Baltimore (online), US
<i>The MIR fitting capabilities of q3dfit, a PSF deconvolution and spectral analysis tool in the wake of JWST</i> | 03/2022 |
| ○ “Young Astronomers on Galactic Nuclei (YAGN)”, Copenhagen (online), Denmark
<i>MASCOT: The link between molecular gas and radially resolved galaxy properties in SDSS-IV MaNGA</i> | 09/2021 |
| ○ National Astronomy Meeting (NAM), Bath (online), UK
<i>MASCOT: The link between molecular gas and radially resolved galaxy properties in SDSS-IV MaNGA AGN</i> | 07/2021 |
| ○ “Extragalactic Spectroscopic Surveys: Past, Present and Future of Galaxy Evolution”, Santiago, Chile (cancelled due to COVID-19 outbreak)
<i>Scatter in the star-forming main sequence: A remnant of long-term variations in stellar mass growth?</i> | 10/2020 |
| ○ “Birth, life and fate of massive galaxies and their central beating heart”, Favignana, Italy
<i>CO- vs dust-based gas masses and assessment of the dynamical mass budget</i> | 09/2018 |
| ○ “Synergy between low and high redshift galaxy evolution studies in the era of JWST and EUCLID”, Noordwijk, Netherlands
<i>Cross-calibrating CO- and dust-based gas masses while dynamically assessing the mass budget</i> | 07/2018 |
| ○ “Galaxy Evolution across time”, Paris, France
<i>Cross-calibrating CO- and dust-based gas masses and their dependence on environment</i> | 06/2017 |
| ○ High Energy Astrophysics Seminar, Harvard-Smithsonian CfA, Cambridge, US
<i>Are we missing ultramassive, slowly spinning Black Holes in the SDSS colour selection?</i>
URL: https://www.youtube.com/channel/UCMFEeX24_lviXNhek5-FFLA | 09/2016 |

GRANTS

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

2-week working visit to the MPE in Garching near Munich (Germany)

OBSERVING PROPOSALS

- “Revealing the origin of variations in the baryon conversion efficiency of Brightest Cluster Galaxies”, Co-I (PI: Dr. Stijn Wuyts), MUSE 03/2019
- “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
- 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-organiser 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

**Observational
experience**

Carrying out remote co-observations with the ARO ($> 100\text{h}$), data reduction
of CO spectra

REFERENCES

Available upon request