Curriculum Vitæ

Felix Widmann

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Education

December 2021 – Today

Postdoctoral Researcher in Astrophysics
Max Planck Institute for Extraterrestrial Physics Munich, Germany

- Research Topic: *Instrumental work on GRAVITY+ and studies of the supermassive black hole Sgr A**

September 2017 – November 2021

PhD in Astrophysics
Max Planck Institute for Extraterrestrial Physics Munich, Germany

- Research Topic: *Instrumental Progress to test General Relativity in the Galactic Center*
- Supervisor: Prof. Dr. Reinhard Genzel

October 2014 – July 2017

Master of Science in Physics
Ruprecht-Karls-Universität Heidelberg, Germany

October 2011 – September 2014

Bachelor of Science in Physics
Ruprecht-Karls-Universität Heidelberg, Germany

Talks & Conferences

Galactic Center Workshop (Granada, Spain) — April 2023
*Talk: Polarized hotspots orbiting Sgr A**

eXtreme black holes (Aspen, USA) — March 2023
Talk: Observation of polarized hotspots

SPIE Astronomical Telescopes & Instrumentation 2022 (Montreal, Canada) — July 2022
Talk: GRAVITY-Faint: reducing noise sources in GRAVITY+

Sharpest Eye in the Sky (Exeter, UK) — April 2022
Talk: The Galactic Center with GRAVITY

VLTI Summer School (online) — June 2021
Lecture: The GRAVITY instrument and its science results

SPIE Astronomical Telescopes & Instrumentation 2020 (online) — December 2020
Talk: Polarization analysis of GRAVITY and the VLTI

Annual meeting of the MAGIC Collaboration (online) — November 2020
Invited public Talk: The Galactic Center black hole

Jahrestagung der Astronomischen Gesellschaft (online) — September 2020
Talk: The Galactic Center black hole with GRAVITY

SPIE Astronomical Telescopes & Instrumentation 2018 (Austin, USA) — June 2018
Talk: The piston reconstruction experiment
Poster: Improving GRAVITY towards fainter targets

NYRIA annual workshop (Leiden, Netherlands) — May 2018
Talk: Measuring polarization with the VLTI

Wavefront sensing in the VLT/ELT era (Marseille, France) — October 2016
Talk: How to use wavefront data to measure differential piston for interferometry

First & Corresponding Author publications

GRAVITY Collaboration (submitted), *Polarization model of the VLTI and GRAVITY*

Widmann, F. et. al (2022), *GRAVITY faint: reducing noise sources in GRAVITY+ with a fast metrology attenuation system* SPIE, V12183, 121830U

GRAVITY Collaboration (2022), *Mass distribution in the Galactic Center based on interferometric astrometry of multiple stellar orbits* A&A, 657, L12, 17

GRAVITY Collaboration (2021), *Improved GRAVITY astrometric accuracy from modeling optical aberrations* A&A, 647, A, 59G

GRAVITY Collaboration (2020), *The flux distribution of Sgr A**, A&A, 638, A2, 12

GRAVITY Collaboration (2019), *Test of the Einstein Equivalence Principle near the Galactic Center Supermassive Black Hole*, PhRvL, 475, 1224

Widmann, F., Pott, J.-U., Velasco, S. (2018), *P-REx: The Piston Reconstruction Experiment for infrared interferometry*, MNRAS, 122, 10, 101102

Widmann, F., Beuther, H., Schilke, P., Stanke, T. (2016), *SiO: Not the perfect outflow tracer*, A&A, 589, A29

Co-Author publications with major contributions

GRAVITY Collaboration (in prep), *Polarimetry and Astrometry of NIR Flares as Event Horizon Scale, Dynamical Probes for the Mass of Sgr A**

GRAVITY+ Collaboration (2022), *First light for GRAVITY Wide. Large separation fringe tracking for the Very Large Telescope Interferometer* A&A, 665, A75, 15

GRAVITY Collaboration (2020), *Dynamically important magnetic fields near the event horizon of Sgr A** A&A, 643, A, 56G

GRAVITY Collaboration (2020), *Detection of the Schwarzschild precession in the orbit of the star S2 near the Galactic centre massive black hole*, A&A, 636, L5, 14

GRAVITY Collaboration (2018), *A geometric distance measurement to the Galactic center black hole with 0.3% uncertainty*, A&A, 625, L10, 10

GRAVITY Collaboration (2018), *Detection of the gravitational redshift in the orbit of the star S2 near the Galactic centre massive black hole*, A&A, 615, L15, 10

Observing Experience

Very Large Telescope Interferometer, Chile

GRAVITY UTs: > 50 nights
GRAVITY ATs: > 10 nights

Very Large Telescope, Chile

SINFONI: > 10 nights

Technical Experience

OS	Linux/Unix, Windows
Programming	Python, Matlab, bash Some experience in: Haskell, C, C++, Yorick
Typesetting	LaTeX, Microsoft Office
Data reduction	spred (SINFONI), GRAVITY DRS, esoreflex, GILDAS
Data analysis	molecfit

Languages

German	Mother tongue
English	Fluent
Spanish	Very good command
Dutch	Good command

Full list of publications

64. GRAVITY Collaboration (2023), *Where intermediate-mass black holes could hide in the Galactic Centre. A full parameter study with the S2 orbit*, A&A, 672, A63, 11
63. Hikley, S. et. al (2023), *Direct discovery of the inner exoplanet in the HD 206893 system. Evidence for deuterium burning in a planetary-mass companion*, A&A, 671, L5, 11
62. Young, A. et. al (2023), *Accelerations of stars in the central 2-7 arcsec from Sgr A**, A&A, 670, A36, 18
61. von Fellenberg, S. et. al (2023), *General relativistic effects and the near-infrared and X-ray variability of Sgr A**, A&A, 669, L17, 13
60. GRAVITY Collaboration (2023), *The GRAVITY young stellar object survey. IX. Spatially resolved kinematics of hot hydrogen gas in the star-disk interaction region of T Tauri stars*, A&A, 669, A59, 40
59. GRAVITY Collaboration (2023), *Toward measuring supermassive black hole masses with interferometric observations of the dust continuum*, A&A, 669, A14, 11
58. GRAVITY+ Collaboration (2022), *The GRAVITY+ Project: Towards All-sky, Faint-Science, High-Contrast Near-Infrared Interferometry at the VLTI*, Messenger V189, p17
57. GRAVITY+ Collaboration (2022), *First light for GRAVITY Wide. Large separation fringe tracking for the Very Large Telescope Interferometer*, A&A, 665, A75, 15
56. Widmann, F. et. al (2022), *GRAVITY faint: reducing noise sources in GRAVITY+ with a fast metrology attenuation system*, Proc. SPIE, V12183, 121830U
55. Drescher, A. et. al (2022), *GRAVITY+ Wide: towards hundreds of z 2 AGN*, Proc. SPIE, V12183, 121830T
54. von Fellenberg, S. et. al (2022), *The Young Stars in the Galactic Center*, A&A, 932, L6, 29
53. Perera, S. et. al (2022), *Piston Reconstruction Experiment (P-REx) - II. Off-line performance evaluation with VLTI/GRAVITY* , MNRAS, 511, 5709
52. Dallilar, Y. et. al (2022), *Flaremodel: An open-source Python package for one-zone numerical modelling of synchrotron sources* , A&A, 658, A111, 9
51. GRAVITY Collaboration (2022), *Mass distribution in the Galactic Center based on interferometric astrometry of multiple stellar orbits*, A&A, 657, L12, 17
50. GRAVITY Collaboration (2022), *Deep images of the Galactic center with GRAVITY*, A&A, 657, A82, 24
49. GRAVITY Collaboration (2021), *The GRAVITY young stellar object survey. VIII. Gas and dust faint inner rings in the hybrid disk of HD141569*, A&A, 655, A112, 22
48. GRAVITY Collaboration (2021), *The GRAVITY young stellar object survey. VII. The inner dusty disks of T Tauri stars*, A&A, 655, A73, 20
47. Lacour, S. et. al (2021), *The mass of β Pictoris c from β Pictoris b orbital motion* , A&A, 654, L2, 11
46. GRAVITY Collaboration (2021), *The GRAVITY young stellar object survey. VI. Mapping the variable inner disk of HD 163296 at sub-au scales*, A&A, 654, A, 97G
45. GRAVITY Collaboration (2021), *A geometric distance to the supermassive black Hole of NGC 3783*, A&A, 654, A, 85G
44. GRAVITY Collaboration (2021), *Constraining particle acceleration in Sgr A* with simultaneous GRAVITY, Spitzer, NuSTAR, and Chandra observations* , A&A, 654, A, 22G
43. Kammerer, J. et. al (2021), *GRAVITY K-band spectroscopy of HD 206893 B. Brown dwarf or exoplanet* , A&A, 652, A, 57K
42. GRAVITY Collaboration (2021), *MOLsphere and pulsations of the Galactic Center's red supergiant GCIRS 7 from VLTI/GRAVITY* , A&A, 651, A, 37G
41. Jiménez-Rosales, A. et. al (2021), *Relative depolarization of the black hole photon ring in GRMHD models of Sgr A* and M87**, MNRAS, 503 4563J
40. GRAVITY Collaboration (2021), *The central parsec of NGC 3783: a rotating broad emission line region, asymmetric hot dust structure, and compact coronal line region*, A&A, 648, A, 117G
39. GRAVITY Collaboration (2021), *The GRAVITY young stellar object survey. V. The orbit of the T Tauri binary star WW Cha*, A&A, 648, A, 37G
38. Wang, J. J. et. al (2021), *Constraining the Nature of the PDS 70 Protoplanets with VLTI/GRAVITY*, AJ, 161, 148W
37. GRAVITY Collaboration (2021), *Improved GRAVITY astrometric accuracy from modeling optical aberrations*, A&A, 647, A, 59G
36. GRAVITY Collaboration (2021), *Detection of faint stars near Sagittarius A* with GRAVITY* , A&A, 645, A, 127G

35. GRAVITY Collaboration (2021), *The GRAVITY young stellar object survey. IV. The CO overtone emission in 51 Oph at sub-au scales*, A&A, 645, A, 50G
34. Dexter, J. et. al (2020), *Determining Subparsec Supermassive Black Hole Binary Orbits with Infrared Interferometry*, ApJ, 905, 33D
33. GRAVITY Collaboration (2020), *The spatially resolved broad line region of IRAS 09149-6206*, A&A, 643, A, 154G
32. GRAVITY Collaboration (2020), *Dynamically important magnetic fields near the event horizon of Sgr A**, A&A, 643, A, 56G
31. Dexter, J. et. al (2020), *Sgr A* near-infrared flares from reconnection events in a magnetically arrested disc*, MNRAS, 497, 4, 4999
30. GRAVITY Collaboration (2020), *Direct confirmation of the radial-velocity planet β Pictoris c*, A&A, 642, L2, 8
29. GRAVITY Collaboration (2020), *The GRAVITY young stellar object survey. III. The dusty disk of RY Lup*, A&A, 642, A162, 9
28. Lagrange, A. M. et. al (2020), *Unveiling the β Pictoris system, coupling high contrast imaging, interferometric, and radial velocity data*, A&A, 642, A18, 17
27. GRAVITY Collaboration (2020), *A measure of the size of the magnetospheric accretion region in TW Hydrae*, Nature, 584, 547
26. GRAVITY Collaboration (2020), *The flux distribution of Sgr A**, A&A, 638, A2, 12
25. Dexter, J. et. al (2020), *A parameter survey of Sgr A* radiative models from GRMHD simulations with self-consistent electron heating*, MNRAS, 494, 3, 4168
24. GRAVITY Collaboration (2020), *Detection of the Schwarzschild precession in the orbit of the star S2 near the Galactic centre massive black hole*, A&A, 636, L5, 14
23. GRAVITY Collaboration (2020), *The GRAVITY young stellar object survey. II. First spatially resolved observations of the CO bandhead emission in a high-mass YSO*, A&A, 635, L12, 9
22. GRAVITY Collaboration (2020), *Modeling the orbital motion of Sgr A*'s near-infrared flares*, A&A, 635, A143, 9
21. GRAVITY Collaboration (2020), *The resolved size and structure of hot dust in the immediate vicinity of AGN*, A&A, 635, A92, 14
20. GRAVITY Collaboration (2020), *An image of the dust sublimation region in the nucleus of NGC 1068*, A&A, 634, A1, 12
19. GRAVITY Collaboration (2020), *Peering into the formation history of β Pictoris b with VLTI/GRAVITY long-baseline interferometry*, A&A, 633, A110, 19
18. GRAVITY Collaboration (2019), *The GRAVITY Young Stellar Object survey. I. Probing the disks of Herbig Ae/Be stars in terrestrial orbits*, A&A, 632, A53, 22
17. GRAVITY Collaboration (2019), *Scalar field effects on the orbit of S2 star*, MNRAS, 489, 4, 4606
16. GRAVITY Collaboration (2018), *A geometric distance measurement to the Galactic center black hole with 0.3% uncertainty*, A&A, 625, L10, 10
15. GRAVITY Collaboration (2019), *Test of the Einstein Equivalence Principle near the Galactic Center Supermassive Black Hole*, PhRvL, 475, 1224
14. GRAVITY Collaboration (2019), *First direct detection of an exoplanet by optical interferometry. Astrometry and K-band spectroscopy of HR 8799 e*, A&A, 623, L11, 6
13. Habibi, M. et. al (2019), *Spectroscopic Detection of a Cusp of Late-type Stars around the Central Black Hole in the Milky Way*, ApJL, 872, L15, 7
12. Gillessen, S. et. al (2019), *Detection of a Drag Force in G2's Orbit: Measuring the Density of the Accretion Flow onto Sgr A* at 1000 Schwarzschild Radii*, ApJ, 871, 126, 9
11. GRAVITY Collaboration (2018), *Multiple star systems in the Orion nebula*, A&A, 620, A116, 26
10. GRAVITY Collaboration (2018), *Spatially resolved rotation of the broad-line region of a quasar at sub-parsec scale*, Nature, 567, 7733, 657
9. GRAVITY Collaboration (2018), *Detection of orbital motions near the last stable circular orbit of the massive black hole SgrA**, A&A, 618, L10, 5
8. GRAVITY Collaboration (2018), *GRAVITY chromatic imaging of η Car's core. Milliarcsecond resolution imaging of the wind-wind collision zone*, A&A, 618, A125, 30
7. Von Fellenberg, S. et. al (2018), *A Detection of Sgr A* in the Far Infrared* , ApJ, 862, 2, 129
6. Widmann, F. et. al (2018), *Improving GRAVITY towards observations of faint targets*, Proc. SPIE, 107010K
5. GRAVITY Collaboration (2018), *Detection of the gravitational redshift in the orbit of the star S2 near the Galactic centre massive black hole*, A&A, 615, L15, 10

4. Waisberg, I. et. al (2018), *What stellar orbit is needed to measure the spin of the Galactic centre black hole from astrometric data?*, MNRAS, 476, 3600
3. Widmann, F. et. al (2018), *P-REx: The Piston Reconstruction Experiment for infrared interferometry*, MNRAS, 122, 10, 101102
2. Pott, J.-U. et. al (2016), *P-REx: the piston drift reconstruction experiment*, Proc. SPIE, 99073E
1. Widmann, F. et. al (2016), *SiO: Not the perfect outflow tracer*, A&A, 589, A29