

## Sera Markoff

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### PERSONAL DETAILS

**Date and place of birth** 6 July 1971, Minneapolis, MN, USA

**Citizenship** USA

**Languages** English (native), Dutch (near fluent), German (was once near fluent...)

### EDUCATION

**2000** PhD, Theoretical Astrophysics Program, University of Arizona, Tucson, AZ, USA , thesis title “High Energy Processes in the Galactic Center”

**1996** M.A., Physics/Theoretical Astrophysics, University of Arizona, Tucson, AZ, USA

**1993** B.S., Physics, Massachusetts Institute of Technology, Cambridge, MA, USA

### CAREER EXPERIENCE

**2017- present** Full Professor, University of Amsterdam (UvA). *Supervision to date: 14 postdocs, 12 PhDs, 20 MSc students, 11 BSc students*

**2016- 2022** Founding member Event Horizon Telescope (EHT) Collaboration Science Council, Vice-Chair from 2019-2022

**2008- 2016** Universitair Hoofddocent (Associate Prof.), UvA

**2011 - 2014** Director Master’s Program in Astronomy & Astrophysics, UvA

**2006-2008** Universitair Docent (Assistant Professor), UvA

**2002-2005** National Science Foundation Astronomy & Astrophysics Postdoctoral Fellow, Massachusetts Institute of Technology, Cambridge, MA, USA

**2000-2002** A.v. Humboldt Foundation Research Fellow, Max Planck Institute for Radio Astronomy, Bonn, Germany

**1994-2000** Graduate student researcher at University of Arizona, Tucson, AZ, USA, advisor: Prof. Fulvio Melia

**1993-1994** Visiting graduate student researcher at the Racah Institute for Physics, Hebrew University, Jerusalem, Israel, host: Prof. Avishai Dekel

**1990-1993** Undergraduate researcher at the MIT Center for Space Research, advisor: Prof. Claude Canizares, thesis: “The Unusual ROSAT Quasar PG1407+265”

### RESEARCH INTERESTS

Accretion and outflows around black holes of all mass scales, and the relationship between them, as well as their impact on their surroundings. High energy astrophysics, astroparticle physics, jetted transients, multi-messenger astrophysics from low-frequency radio through gamma-rays, as well as cosmic rays and neutrinos. Instrumentation: The global mm-VLBI project The Event Horizon Telescope, and the next generation GeV/TeV gamma-ray facility Cherenkov Telescope Array (CTA), as well as software development to simultaneously analyse multi-messenger signals.

## AWARDS & HONORS (SINCE 2000)

- 2022** ERC Synergy Grant “BlackHolistic” co-PI
- 2022** Biard Endowed Public Lecture, Ohio State University, Columbus, Ohio, USA
- 2022** Distinguished visitor, Black Hole Initiative, Harvard University (May-June)
- 2021** Named member of the Royal Holland Society of Sciences and Humanities (KHMW)
- 2021** UK Royal Astronomical Society Group Achievement Award (Awarded to the Event Horizon Telescope Collaboration; EHTC)
- 2020** Dutch Research Council (NWO) Domain Science Diversity Prize (for ongoing projects with elementary school children from under-represented backgrounds, and their families), €50k
- 2020** Breakthrough Prize in Fundamental Physics (\$3M); Bruno Rossi Prize of the American Astronomical Society; Einstein Medal of the Albert Einstein Society (Awarded to the EHTC for the first image of a supermassive black hole)
- 2019** Berkeley Prize of the American Astronomical Society; Diamond Achievement of the US National Science Foundation; Smithsonian American Ingenuity Award (Natural Sciences) (Awarded to the EHTC)
- 2019** Willem de Graaff Prize for Public Outreach (Royal Dutch Astronomical Society)
- 2019** Grassroots Diversity Award (University of Amsterdam Science Faculty)
- 2018** Westerdijk Professorship Prize (NWO)
- 2015** VICI personal career award (NWO): *From micro- to mega-scales: understanding how black holes shape the local Universe* (5 years)
- 2015** Tinsley Centennial Visiting Professorship, UT Austin, 2/20/15-5/2/15
- 2014** Named Fellow of the American Physical Society (top 0.5% of membership)
- 2013** Visiting Professorship, University Paris Diderot (VII), 3/1/13 – 5/31/13
- 2007** VIDI personal career award (NWO), *Understanding the Physics of Black Hole Jets and Accretion States from Stellar to Galactic Scales* (5 years)
- 2002** National Science Foundation Astronomy & Astrophysics Postdoctoral Research Fellowship
- 2000** Alexander von Humboldt Foundation Research Fellowship

## SELECTED RESEARCH GRANTS

- 2023** NWO Research Infrastructure Consortium “The Africa Millimetre Telescope (AMT) - making colour movies of black holes”, €3.5M (PI: H. Falcke, coPI S. Markoff)
- 2022** ERC Synergy Grant “BlackHolistic”, €13.8M (3PIs: H. Falcke, R. Fender, S. Markoff)
- 2020** NWO Large Project: *A major Dutch contribution to CTA by building cameras for this next generation gamma-ray observatory*; €2M (PI: J. Vink, Project Scientist: Markoff, Co-PIs: A. Baryshev, M. Vecchi, C. Weniger)
- 2020** NWO/NWA ORC, *Dutch Black Hole Consortium*, €4.9M (PI: P. Jonker, Markoff: CoPI and member of the Consortium Board)
- 2015** NWO VICI innovation grant + Aspasia subsidy, €1.6M
- 2014** NWO Astroparticle Physics Program, *Determining the contribution of X-ray Binaries to the Galactic cosmic ray population, and their TeV emission properties*, (Co-PIs: S. Markoff & B. Achterberg), €215k
- 2014** NWO Astroparticle Physics Program, *CTA-NL: Establishing the Netherlands as full member country of the Cherenkov Telescope Array*, (PI: D. Berge, CoIs: Markoff, Vink, Venema, Stuik, Hörandel, van den Berg), €645k
- 2013** NOVA-4 Instrumentation, *Camera & Detector Development for CTA*, (PI: J. Vink, CoIs: Berge, Markoff, Hörandel, Stuik, Venema, van den Berg), €1.5M

**2013** NWO Open Competition, *First steps towards calibrating black hole jet feedback: a decisive link between inflow and outflow*, €180k

**2012** NWO Graduate Programme proposal for GRAPPA (Co-PI with J. Vink, P. Decowski, J. de Boer), €800k

**2011** NASA Chandra X-ray Visionary Program: 3Msec on Galactic supermassive black hole Sgr A\* (Co-PI with F. Baganoff & M. Nowak), \$390k

**2008** Co-coordinator, with Jörn Wilms (Uni Erlangen), of the EU FP7 Marie Curie Initial Training Network “Black Hole Universe” linking UvA, Erlangen/Nürnberg (D), Southampton (UK), CEA Saclay (F), INAF Brera (IT), U Cagliari (IT) and Sabanci University (Turkey), ~€2.5M

**2007** NWO VIDI innovation grant + Aspasia subsidy, €700k

**2007** NASA Astrophysics Theory Program grant (PI: D. Meier, CoIs: Markoff, Nakamura & Fragile), \$311k

**2006** NWO Open Competition, *Constraining jet physics in accreting black holes*, €185k

## REFEREED PUBLICATIONS

As of May 2023 (from ADS): 244 refereed publications, ~23k citations, 51 >100 citations, h=74

For the full list see:

<https://ui.adsabs.harvard.edu/search/p=0&q=author%3A%22Markoff%2C%20S.%22%20property%3Arefereed&sort=date%20desc%2C%20bibcode%20desc>

## BOOKS & WHITE PAPERS

Chapter “Cosmic Accelerators” (coordinators **Markoff, S.**, Matthews, J. & Ramirez-Ruiz, E.) in the European Consortium for Astroparticle Theory (EuCAPT) Strategy White Paper “*Opportunities and Challenges for Theoretical Astroparticle Physics in the Next Decade*” (135 authors, 400 endorsers), arXiv: 2110: 10074

Chapter “Science Synergies” (**Markoff, S.**, Hinton, J.A., Ong, R.A. & Torres, D.) in *Science with the Cherenkov Telescope Array*, (online book, arXiv:1709.07997) by the Cherenkov Telescope Array collaboration.

Chapter “Relativistic Jets in Active Galactic Nuclei and Microquasars” (Romero, G., Böttcher, M., Markoff, S. & Tavecchio, F.) in *Jets and Winds in Pulsar Wind Nebulae, Gamma-ray Bursts and Blazars: Physics of Extreme Energy Release*, Ed. A. Bykov, et al., 2017 (Springer Verlag: Heidelberg), p. 1-57, also in press via Space Science Reviews.

Chapter “From Multiwavelength to Mass Scaling: Accretion and Ejection in Microquasars and AGN” in *The Jet Paradigm: From Microquasars to Quasars*, Lecture Notes in Physics vol. 794, Ed. T. Belloni, 2010 (Springer Verlag: Heidelberg), p. 143

Proceedings of the Galactic Center Workshop, 2002: The Central 300 Parsecs of the Milky Way. Astronomische Nachrichten Supplementary Issue 1/2003, Editors: A. Cotera, S. Markoff, T.R. Geballe, H. Falcke

## SERVICE/COMMITMENTS OF TRUST

**TEACHING:** Developed four new courses: *Introduction to Cosmology (BSc)*, *HEA: Radiative Processes and Relativistic Flows (MSc)*, *Extreme Astrophysics (MSc)*, *Modern Astrophysics (BSc)*, and have taught every year since 2006.

## CURRENT/ONGOING

- Autumn 2024: Member panel, Quality Review of the School of Physics at Trinity College Dublin

- ▶ 2023-present: Member External Scientific Advisory Committee Institute of Astrophysics of the Foundation for Research and Technology - Hellas (IA-FORTH)
- ▶ 2023-present: Chair of the Astronomy Advisory panel to the Dutch Research Council (NWO), member since 2018
- ▶ 2023-present: Member Jury Unesco/L'Oreal For Women in Science Prize (NL)
- ▶ 2022-present: Member ALLEGRO (European ALMA Regional Center) Steering Committee
- ▶ 2022-present: Member EGO (European Gravitational Observatory) STAC
- ▶ 2022-present: ACES (ALMA Central Molecular Zone Exploration Survey) Large Project external advisory/oversight committee
- ▶ 2021-present: Member next-generation Event Horizon Telescope (EHT) project, Transients Science WG co-coordinator
- ▶ 2020-present: Chair Stichting Beta Plus (for naming Special/Adjunct Professors at UvA/FNWI), member since 2016
- ▶ 2020-present: Member of Board: Kapteyn/Pastoor Schmeits Fonds
- ▶ 2019-present: Member of Board: National Dutch Network of Female Professors (LNVH)
- ▶ 2018-present: Member EDI Taskforce, Event Horizon Telescope Collaboration (EHTC)
- ▶ 2016-present: Co-coordinator Multiwavelength Science Working Group, EHTC
- ▶ International Conference Organisation (Scientific Organising Committees)
  - Cherenkov Telescope Array Symposium, April 2024, Bologna, IT
  - Galactic Center Workshop, April 2023, Granada, Spain

#### PAST (SINCE 2010)

- ▶ 2021: Co-convener of EuCAPT White Paper chapter on “Cosmic Accelerators”
- ▶ 2021, 2022: Member of NWO Diversity Prizes selection committee
- ▶ 2020-2022: Vice-Chair of the Event Horizon Telescope Collaboration Science Council (member since 2016)
- ▶ 2017-2022: Member of PhD supervision oversight committee, API, UvA
- ▶ 2016-2018: Science Coordinator of the Multiwavelength Working Group for the Cherenkov Telescope Array (CTA)
- ▶ 2016: Member committee to draft “FNWI Visie Onderwijs & Onderzoek” (Research and Education Vision Document) for the Science Faculty of the UvA
- ▶ 2015-2020: Elected member of the steering committee for the IAU (International Astronomical Union) Commission X-1: Supermassive Black Holes, Feedback, Galaxy Evolution
- ▶ 2015-2018: Editor of Astroparticle Physics Journal (Elsevier)
- ▶ 2015-2018: Member of the Chréien International Research Grant selection committee for the American Astronomical Society
- ▶ 2014-2017: Chair: Lorentz Center Astronomy Steering Committee (member since 2011)
- ▶ 2013-2014: Member of Exploratory Committee on Education for UvA/VU
- ▶ 2012-2021: member of Institute Management Team, API, University of Amsterdam
- ▶ 2011: Founding member of GRAPPA Institute, UvA (5 faculty hires)
- ▶ 2011-2014: Director of the Master Program in A&A, University of Amsterdam
- ▶ 2011-2014: Member of the UvA Board of Studies for Graduate School of Exact Sciences
- ▶ 2011-2015: Member of Dutch National Physics Association (NNV) subatomic physics steering committee
- ▶ 2010-2016: Member Cherenkov Telescope Array (CTA) Consortium (PHYSics working group)
- ▶ 2010-2019: Member of the Dutch Astroparticle Physics Steering Committee (CAN)
- ▶ 2010-2011: Member of MacGillavry Program hiring committee, UvA
- ▶ 2010-2011: Member of PhD supervision oversight committee, API
- ▶ International Conference Organisation (Scientific Organising Committees) **since 2013**
  - COSPAR 44th Scientific Assembly workshop: “Broad-band and multi-messenger view of high-energy transient phenomena”, July 2022, Athens, GR

- COSPAR 44th Scientific Assembly workshop: "Signatures of cosmic black holes", July 2022, Athens, GR
- "Black Hole accretion under the X-ray microscope" conference, June 2022, ESAC, Spain
- EAS 2021 Session: "Birth, Life and Death of Black Holes"
- Microquasar Conference 2021: Sept 2021, Sardinia IT
- IAU Proposed Symposium: Accretion and Outflow: From Planets to Active Galactic Nuclei, Busan, South Korea, Aug 2021
- "New Horizons in Galactic Center Astronomy and Beyond", Yokohama, Oct 2019
- **Chair:** "Advances in Theoretical Astrophysics" international school, Amsterdam, July 2019
- "Cosmic Explosions" international school, Cargese, FR, May/June 2019
- Multi-Messenger Astrophysics Symposium), Groningen, March 2019
- "The Central Arcsecond of the Galaxy", Ringberg Castle, Oct. 2018
- **Co-Chair:** Open Problems in Theoretical Astrophysics, NBI, Copenhagen, July 2018
- Time-Domain Astronomy: A High-Energy View, ESAC, Spain, June 2018
- Texas Relativistic Symposium on Relativistic Astrophysics, Cape Town, South Africa, Dec 2017
- Microquasars 2017, Porquerolles Island, FR, Sep. 2017
- **Co-Chair:** IAU Symposium 322, "The Multi-Messenger Astrophysics of the Galactic Centre", Port Douglas, Australia, July 2016
- "Meierfest": Astrophysical Jets on All Scales, Caltech, March 2015
- Event Horizon Telescope 2014, Perimeter Institute, Waterloo, Canada, Nov. 2014
- 40th Cospar Scientific Assembly: "New broadband perspectives on the Galactic center black hole and its environment", Moscow, Aug. 2014
- **Chair:** IAU pre-meeting workshop on Sgr A\* *Chandra* XVP campaign results, Santa Fe, NM, Sept/Oct 2013
- **Co-Chair:** IAU Symposium 303: "The galactic center: Feeding and feedback in a normal galactic nucleus", Santa Fe, NM, Sept/Oct 2013
- Brindisi Workshop: "Black Hole (g)Astronomy: exploring the different flavors of accretion", Brindisi, Italy, Sept 2013
- **Chair:** "A new view of accretion onto our Galactic Center", Lorentz Center workshop, January 2013
- Served on selection panels for the NSF Astronomy & Astrophysics Postdoctoral Fellows program and NASA Hubble/Einstein Fellowship Program
- Served on Time Allocation Committee for NASA's Chandra Observatory, 2006, 2008, 2011 (Deputy Panel Chair), 2016 (Panel Chair). NASA's Hubble Space Telescope 2022 and NASA's JWST 2023
- Served on the review panels for the NSF (National Science Foundation) CAREER grant program
- Referee for Science, Nature, Nature Astronomy, Astronomy & Astrophysics, Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Astroparticle Physics Journal, plus several international funding agencies (ERC, USA, Netherlands, France, Belgium, Czech Republic, Poland, Israel, South Africa)

## INVITED TALKS AND COLLOQUIA (SINCE 2017)

- 2/2024 Ehrenfest Colloquium series, Leiden University
- 10/2024 Colloquium, Niels Bohr Institute, Copenhagen, DK
- 9/2023 High Energy Astrophysics @ Southern Africa meeting, Kwa-Zulu Natal, SA
- 5/2023 AlbaNova Institute Colloquium, Stockholm, SE
- 3/2023 Physics Colloquium, NTSU, Trondheim, NO
- 3//2023 Colloquium, IRAP, Toulouse, FR

- 2/2023 Max Planck Institute for Nuclear Physics, “Tea Colloquium”, Heidelberg, DE
- 2/2023 Physics Colloquium, Vrije Universiteit, Amsterdam, NL
- 1/2023 Physics Colloquium, Oxford University
- 10/2022 Astrophysics Colloquium, UCLA
- 10/2022 Biard endowed public lecture “Imaging (and imagining) black holes”
- 9/2022 Colloquium, Case Western Reserve University Physics Department (online)
- 9/2022 Astro-Colibri meeting: “EHT in the era of Multi-messenger transients”, Bochum, DE
- 6/2022 AAS@240 special session First Sgr A\* EHT Results, “The Shadow of the Supermassive Black Hole in the Center of the Milky Way”, Pasadena, CA
- 6/2022 Cospar 44th Scientific Assembly, Interdisciplinary Plenary talk, Athens, GR
- 5/2022 Black Hole Initiative Conference: “ngEHT: calibrating the impact of black holes in the (local) Universe, Harvard University
- 1/2022 Physics@Veldhoven Special Session: “Understanding the physics of cosmic-ray pevatrons” talk on Science with CTA, Veldhoven, NL
- 12/2021 CTA “Journey Through the Extreme Universe” lecture (online)
- 12/2021 Colloquium, Center for Computational Astrophysics, Flatiron Inst., NYC, US
- 9/2021 Association of Asia Pacific Physical Societies, Division of Plasma Physics (AAPPS-DPP) 2021 conference, invited plenary (online)
- 6/2021 Munich Joint Astronomy Colloquium, Munich, DE (online)
- 6/2021 EAS Special Session 3: *Black holes under the magnifying glass of XRISM and Athena* (online)
- 6/2021 EAS Special Session 27: *Under the Gamma-ray Sky of the Canary Islands* (online)
- 6/2021 Munich Joint Astronomy Colloquium, Munich, DE (online)
- 5/2021 Colloquium, ESAC, Madrid, Spain (online)
- 5/2021 Astrophysics Colloquium, Tel Aviv University, IL (online)
- 3/2021 30th Elizabeth Spreadbury Lecture, UCL, UK (online)
- 2/2021 Next generation Event Horizon Telescope (ngEHT) Workshop (online)
- 1/2021 Astrophysics Colloquium, Durham University, UK (online)
- 1/2021 NITheP Colloquium, South Africa (online)
- 1/2021 Physics@Veldhoven Special Session talk on Foundations of Gravity, NL (online)
- 11/2020 Colloquium, GSSI, Italy (online)
- 11/2020 Astroparticle Physics Colloquium (IIHE ULB-VUB, Brussels (online)

*(from Jan-Nov 2020 many talks were cancelled or moved to the future)*

- 12/2019 20 Years of Chandra, MA, USA
- 11/2019 Astrophysics Colloquium, University of Birmingham
- 10/2019 Science & Cocktails public lecture on black holes, Paradiso, Amsterdam, NL
- 10/2019 Helmholtz Alliance/ECAP Astroparticle Physics School, DE
- 9/2019 Colloquium, Harvard-Smithsonian Center for Astrophysics, MA, USA
- 6/2019 Helen Sawyer Hogg Prize Lecture at the Canadian Astronomical Society (CASCA) meeting, Montreal, CA
- 5/2019 Cosmic Explosions School 2019, Cargese, FR
- 4/2019 Royal Netherlands Academy of Arts and Sciences (KNAW) Symposium on Event Horizon Telescope results

- 4/2019 Event Horizon Telescope announcement, US/NSF Press Conference, National Press Club  
Washington, D.C., USA
- 3/2019 Panel on Event Horizon Telescope @ SXSW Interactive Festival, TX, USA
- 2/2019 Astrophysics Seminar, Trinity University, TX, USA
- 2/2019 Astrophysics Seminar, Laboratoire d'Astrophysique de Marseille, FR
- 10-11/2018 The Central Arcsecond: Towards Testing General Relativity in the Galactic Center,  
Ringberg Castle, DE
- 10/2018 Joint Astrophysics Colloquium (INAF OAS/IRA), Bologna, IT
- 10/2018 Colloquium Leuven University "Gravitational Wave Center"
- 10/2018 Astrophysics Seminar, ESTEC
- 9/2018 2018 Kavli Prize in Astrophysics Symposium, Oslo, Norway
- 1/2018 Astrophysics Colloquium, University of Leicester, UK
- 9/2017 La Gomera Accretion Week 2017, La Gomera, Spain
- 7/2017 International School on Astroparticle Physics (ISAPP) graduate school "The Dark  
and the Visible Side of the Universe", Texel, NL
- 6/2017 Two talks @ EWASS 2017: Special Sessions "S15: Scientific Synergies enabled  
by the SKA, CTA and Athena" and "S4: Astrophysical Jets and Outflows -  
Synergies from compact objects to protostars", Prague, CZ
- 6/2017 Polarised Emission from Astrophysical Jets, Ierapetra, Greece
- 3/2017 Theory Seminar, University of Texas, Austin, US
- 1/2017 Wide Band Spectral and Timing Studies of Cosmic X-ray Sources, TIFR-  
Mumbai, India

## OUTREACH & PRESS (VERY INCOMPLETE...)

- 1/2023: Talk for the Utrecht amateur astronomy Minnaert Association
- 5/2022: Invited speaker, Mayo Dark Skies festival, County Mayo, Ireland
- 5/2022: Participated in the official ESO press release Q&A session for the second ever black hole  
image taken by the Event Horizon Telescope
- 5/2022: Participated in the Dutch national festivities showcasing the new EHT results at the Artis  
Planetarium, including the OCW (Education, Culture & Research) Minister Robert Dijkgraaf
- Since 2017 Leading ongoing STEM project "Altair" focusing on elementary school Groups 7, 8, 9,  
at nearby elementary school Al-Jahwara, since 2022 expanding to Altair+ activities on UVA campus
- 4/2019 Royal Dutch Academy (KNAW) Public Event: "Imaging Black Holes with the Event  
Horizon Telescope"
- 4/2019 National Science Foundation Press Conference for the first image of a black hole,  
representing the EHT Collaboration
- 5/2017 Started pilot STEM project "Altair" focusing on two Group 8 (11-12 yr olds)  
classrooms at Islamic elementary school As-Siddieq Oost
- 4/2016 Keynote talk at "New Realism: The Gaze of Science", *Imagining (and \*imaging\*)*  
*black holes*, Spui 25, Amsterdam, NL
- 4-5/2016 Led two Saturday scientific activity events for refugee children at AZC Leiden,  
under auspices of UNAWE program at Leiden
- 10/2015 Lecture as part of secondary school teachers' 'Naschool': *A Brief Introduction to*  
*Gravity: How a weak force dominates the universe!*

**8/2015** Talk on top of the Oude Kerk as part of art installation “The Garden Which is Nearest to God” and associated talk series “Come Closer”, *Come (a bit) Closer to Infinity*

**5/2015** Talk as part of “We Are Public” Amsterdam cultural events group (with voting system); *A Brief Introduction to Black Holes: Exotic but Essential players in the Universe*

**5/2015** Few volunteer video lectures to an interested group of Indian students about the Galactic center and accretion