

NASA Einstein Fellow
 Center for Astrophysics | Harvard & Smithsonian
 60 Garden Street,
 Cambridge, MA 02138, USA

Tel: (+1) 617-949-1517
 Email: sara.issaoun@cfa.harvard.edu
 Website: sissaoun.github.io

RESEARCH INTERESTS

Astrophysical black holes, accretion flow mechanisms, interstellar medium, Galactic Center, computational imaging, very long baseline interferometry.

EDUCATION

Radboud University, Nijmegen, The Netherlands 2017 – 2021
PhD in Astrophysics supervised by Prof. Dr. H. Falcke (cum laude)
 Thesis title: “*Lifting the Veil on Black Holes: Approaching the Event Horizon with High Resolution Imaging*”

Radboud University, Nijmegen, The Netherlands 2015 – 2017
MSc in Physics and Astronomy, Specialization Particle and Astrophysics (cum laude)

McGill University, Montreal, Qc, Canada 2012 – 2015
BSc in Physics, Minor in Economics

RESEARCH AND TEACHING EXPERIENCE

NASA Einstein Fellow 2021 – present
Center for Astrophysics | Harvard & Smithsonian
 NHFP Postdoctoral Fellowship on “*Connecting Black Hole Shadows to Multi-wavelength Accretion and Outflow Physics*”

Member of the Event Horizon Telescope Collaboration 2015 – present

Graduate Teaching Assistant 2016 – 2020
Faculty of Science, Radboud University

Smithsonian Astrophysical Observatory Predoctoral Fellow 2018
Center for Astrophysics | Harvard & Smithsonian

Graduate Research: Calibration of the Sub-Millimeter Telescope (SMT) 2015 – 2017
Dept of Astrophysics, Radboud University/Steward Observatory, University of Arizona

Master Thesis: VLBA imaging of 3mm SiO masers near Orion Source I 2016 – 2017
Department of Astrophysics, Radboud University

RECENT HONORS AND AWARDS

<i>2021 EHT Thesis Award – Data Analysis Category</i>	2021
<i>L’Oreal Netherlands For Women In Science Rising Talent Prize (1st place)</i>	2021
<i>NASA Hubble Fellowship Program – Einstein Fellowship</i>	2021
<i>Sub-Millimeter Array Postdoctoral Fellowship (deferred to 2024)</i>	2021
<i>2020 EHT Early Career Award –</i> for contributions to the observations, array calibration, data validation, and imaging of the 2017 EHT data, leading to the results published in the first six EHT papers	2020
<i>2020 Einstein Medal for EHT – as member of the EHT</i>	2020
<i>2020 Breakthrough Prize in Fundamental Physics for EHT – as member of the EHT</i>	2020
<i>Radboud University Team Science Award – as member of RU EHT team</i>	2019
<i>NSF Diamond Achievement Award – as member of the EHT</i>	2019
<i>Radboud University – C. Mohrmann Stipend for outstanding female PhD candidates</i>	2019
<i>Radboud University – Best Faculty of Science Thesis Prize</i>	2018

RECENT SCIENTIFIC TALKS

PyCon US 2022. Keynote Speaker.	Apr 2022
Black Hole PIRE Webinar Series on the Galactic Center Talk	Feb 2022
Designing the ngEHT to Transform Black Hole Science conference Invited Talk	Nov 2021
Galaxy Evolution Seminar, University of Oxford (remotely)	Oct 2021
HEASA conference Invited Talk (remotely)	Sept 2021
CASPER Workshop Invited Talk (remotely)	May 2021
Radboud Colloquium on EHT polarization results	Mar 2021
COSPAR Invited Talk (remotely)	Jan 2021
NCAC Colloquium, Polish Academy of Sciences (remotely)	Oct 2020
Black Hole Initiative Colloquium, Harvard (remotely)	Sept 2020
McGill Space Institute Astronomy Seminar, McGill (remotely)	Sept 2020
Caltech Astronomy Tea Talk, Caltech (remotely)	June 2020
CIERA Theory Meeting talk, Northwestern University	Feb 2020
EHT Special Session Speaker. 235 th AAS, Hawaii, USA	Jan 2020
Invited Talk. Galactic Center Workshop, Yokohama, Japan	Oct 2019
Astronomy Colloquium, IFAE, Barcelona, Spain	Sept 2019
Invited Keynote Talk. EuroSciPy 2019, Bilbao	Sept 2019

RECENT ACADEMIC SERVICE

Organizing Committee and lecturer. 2022 SMA Interferometry School	Jan 2022
Scientific Organizing Committee. EAS 2021 Special Session 11.	Jan – June 2021
Scientific Organizing Committee. 3 rd EHT Imaging Workshop (remotely)	May 2020
Diversity and Inclusion Task Force. EHT Collaboration	Apr 2020 – present
Project Director Search Committee. EHT Collaboration	Nov 2019 – Mar 2020
Scientific Organizing Committee. EHT collaboration meeting 2019	Dec 2019
Scientific Organizing Committee. EHT Polarimetry Workshop	July 2019
Scientific Organizing Committee. EHT collaboration meeting 2018	Nov 2018
Organizing Committee. 2 nd EHT Imaging Workshop	July 2018

RECENT OUTREACH

Talk for Ciencia en Bicicleta at the Planetario de Medellín. (Spanish, remotely)	Aug 2021
Boston Museum of Science Panelist (remotely)	May 2021
Yuri's Night World Space Party Turkey (remotely)	Apr 2021
Guest Speaker, Telus Spark Camp Girls Heart Science (remotely)	Aug 2020
Guest Speaker, Canadian Online Science Fair (remotely)	June 2020
Keynote Speaker. '2020: A Space Odyssey' Symposium, Grinnell College, Iowa	Feb 2020
Invited Panelist. EHT panel at the Genoa Science Festival, Genoa, IT	Nov 2019
Invited Speaker. Flemish Amateur Astronomy Society, Brugges, BE	Oct 2019
Speaker. Public Lectures at the Museum Valkhof, Nijmegen, NL	Apr 2019

References available upon request.

Articles submitted/published in peer-reviewed journals.

Journal acronym index: Astrophysical Journal (ApJ; impact factor 5.745), Astrophysical Journal Letters (ApJL; impact factor 8.374), Astrophysical Journal Supplement (ApJS; impact factor 7.950), Astronomy & Astrophysics (A&A; impact factor 5.636), Physics Review Letters (PRL; impact factor 8.385), International Journal of Modern Physics D (IJMPD; impact factor 2.154)

First author articles.

S. Issaoun, M. D. Johnson, L. Blackburn, A. Broderick, P. Tiede, M. Wielgus, S.S. Doeleman, H. Falcke + others (2021) *Persistent Non-Gaussian Structure in the Image of Sagittarius A* at 86 GHz*. ApJ, Volume 915, 99.

S. Issaoun, M. D. Johnson, L. Blackburn, M. Mościbrodzka, A. Chael, H. Falcke (2019) *VLBI imaging of black holes via second moment regularization*. A&A, 629, A32.

S. Issaoun, M. D. Johnson, L. Blackburn, C. D. Brinkerink, M. Mościbrodzka, A. Chael, C. Goddi, I. Marti-Vidal, J. Wagner, S. S. Doeleman, H. Falcke, T. P. Krichbaum, + 32 others (2019) *The Size, Shape and Scattering of Sagittarius A* at 86 GHz: First VLBI with ALMA*. ApJ, Volume 871, 30.

S. Issaoun, C. Goddi, L.D. Matthews, L.J. Greenhill, M.D. Gray, E.M.L. Humphreys, C.J. Chandler, M. Krumholz, H. Falcke (2017) *VLBA imaging of the 3mm SiO masers in the disk-wind of the high-mass protostellar system Orion Source I*. A&A, Volume 606, A126.

Collaboration articles.*

EHT Collaboration et al. (2021a) *First EHT M87 Results. VII. Polarization of the Ring*. ApJL, Volume 910, L12. **Member of the core writing team.**

EHT Collaboration et al. (2021b) *First EHT M87 Results. VIII. Magnetic Field Structure near the Event Horizon*. ApJL, Volume 910, L13.

EHT Collaboration et al. (2019a) *First EHT M87 Results. I. The Shadow of the Supermassive Black Hole*. ApJL, Volume 875, L1. **Contributor.**

EHT Collaboration et al. (2019b) *First EHT M87 Results. II. Array and Instrumentation*. ApJL, Volume 875, L2. **Contributor.**

EHT Collaboration et al. (2019c) *First EHT M87 Results. III. Data Processing and Calibration*. ApJL, Volume 875, L3. **One of three paper coordinators and main authors.**

EHT Collaboration et al. (2019d) *First EHT M87 Results. IV. Imaging the Central Supermassive Black Hole*. ApJL, Volume 875, L4. **Member of the core writing team.**

EHT Collaboration et al. (2019e) *First EHT M87 Results. V. Physical Origin of the Asymmetric Ring*. ApJL, Volume 875, L5.

EHT Collaboration et al. (2019f) *First EHT M87 Results. VI. The Shadow and Mass of the Central Black Hole*. ApJL, Volume 875, L6.

Co-author articles.

D. Psaltis, **EHT Collaboration** et al. (2020) *Gravitational Test Beyond the First Post-Newtonian Order with the Shadow of the M87 Black Hole*. PRL, 125, 141104.

M. Wielgus, K. Akiyama, L. Blackburn, C.-K. Chan, J. Dexter, S. S. Doeleman, V. L. Fish, **S. Issaoun**, M. D. Johnson, T. P. Krichbaum, R.-L. Lu, D. W. Pesce, G. N. Wong, EHT Collaboration et al. (2020) *Monitoring the Morphology of M87* in 2009-2017 with the Event Horizon Telescope*. ApJ, Volume 901, Issue 1, 67.

R. Gold, **EHT Collaboration** et al. (2020) *Verification of Radiative Transfer Schemes for the EHT*. ApJ, Volume 897, Issue 2, 148.

A. Broderick, **EHT Collaboration** et al. (2020) *THEMIS: A Parameter Estimation Framework for the Event Horizon Telescope*. ApJ Volume 897, Issue 2, 139.

J.Y. Kim, T. P. Krichbaum, A. E. Broderick, M. Wielgus, L. Blackburn, J. L. Gómez, M. D. Johnson, K. L. Bouman, A. Chael, K. Akiyama, S. Jorstad, A. P. Marscher, **S. Issaoun**, M. Janssen, C.-K. Chan, T. Savolainen, D. W. Pesce, F. Özel, EHT Collaboration et al. (2020) *Event Horizon Telescope imaging of the archetypal blazar 3C 279 at an extreme 20 microarcsecond resolution*. A&A, Volume 640, A69.

F. Roelofs, M. Janssen, **EHT Collaboration** et al. (2020) *SYMBA: An end-to-end VLBI synthetic data generation pipeline. Simulating Event Horizon Telescope observations of M87*. A&A, Volume 636, A5.

C. Goddi, G. Crew, V. Impellizzeri, I. Martí-Vidal, L. D. Matthews, H. Messias, H. Rottmann, W. Alef, L. Blackburn, T. Bronzwaer, C.-K. Chan, J. Davelaar, R. Deane, J. Dexter, S. Doeleman, H. Falcke, V. L. Fish, R. Fraga-Encinas, C. M. Fromm, R. Herrero-Illana, **S. Issaoun**, D. James, M. Janssen, M. Kramer, T. P. Krichbaum, M. De Laurentis, E. Liuzzo, Y. Mizuno, M. Moscibrodzka, I. Natarajan, O. Porth, L. Rezzolla, K. Rygl, F. Roelofs, E. Ros, A. L. Roy, L. Shao, H. Jan van Langevelde, I. van Bemmelen, R. Tilanus, P. Torne, M. Wielgus, Z. Younsi, J. A. Zensus (on behalf of the EHT collaboration) (2019) *First M87 Event Horizon Telescope Results and the Role of ALMA*. The Messenger, vol. 177, p. 25-35.

L. Blackburn, C.-K. Chan, G. B. Crew, V. L. Fish, **S. Issaoun**, M. D. Johnson, M. Wielgus, K. Akiyama, J. Barrett, K. L. Bouman, R. Cappallo, A. A. Chael, M. Janssen, C. J. Lonsdale, S. S. Doeleman (2019) *EHT-HOPS pipeline for millimeter VLBI data reduction*. ApJ, Volume 882, 23.

O. Porth, **EHT Collaboration** et al. (2019) *The Event Horizon General Relativistic Magnetohydrodynamic Code Comparison Project*. ApJS, Volume 243, Issue 2, 26.

C. D. Brinkerink, C. Müller, H. D. Falcke, **S. Issaoun**, K. Akiyama, G. C. Bower, T. P. Krichbaum, A. T. Deller, E. Castillo, S. S. Doeleman, R. Fraga-Encinas, C. Goddi, A. Hernández-Gómez, D. H. Hughes, M. Kramer, J. León-Tavares, L. Loinard, A. Montaña, M. Mościbrodzka, G. N. Ortiz-León, D. Sanchez-Argüelles, R. P. J. Tilanus, G. W. Wilson, A. Zensus (2019) *Micro-arcsecond structure of Sagittarius A* revealed by high-sensitivity 86 GHz VLBI observations*. A&A, Volume 621, A119.

C. Goddi, H. Falcke, M. Kramer, L. Rezzolla, C. Brinkerink, T. Bronzwaer, R. Deane, M. De Laurentis, G. Desvignes, J. R. J. Davelaar, F. Eisenhauer, R. Eatough, R. Fraga-Encinas, C. M. Fromm, S. Gillessen, A. Grenzebach, **S. Issaoun**, M. Janßen, R. Konoplya, T. P. Krichbaum, R. Laing, K. Liu, R.-S. Lu, Y. Mizuno, M. Moscibrodzka, C. Müller, H. Olivares, O. Porth, O. Pfuhl, +10 others (2017) *BlackHoleCam: fundamental physics of the Galactic center*. IJMPD, Volume 26, Issue 2.

Collaboration memos and documentation.*

S. Steel, M. Wielgus, L. Blackburn, **S. Issaoun**, M. D. Johnson (2019) *Global calibration of instrumental polarimetric phase gains*. Memo CE-2019-03 for the EHT project.

M. Wielgus, L. Blackburn, **S. Issaoun**, M. Janssen, M. D. Johnson, J.-Y. Koay (2019) *EHT data set validation and characterization of errors*. Memo CE-2019-02 for the EHT project.

M. Janssen, L. Blackburn, **S. Issaoun**, T. P. Krichbaum, M. Wielgus (2019) *Flux Density Calibration of the EHT Array*. Memo CE-2019-01 for the EHT project.

S. Issaoun, H. Falcke, P. Friberg, M. Janssen, R. Tilanus, J. Wouterloot (2018) *James Clerk Maxwell Telescope Calibration Memo: Time dependence of the aperture efficiency and DPFU*. Memo CE-2018-01 for the EHT project.

S. Issaoun, T.W. Folkers, D.P. Marrone, J. Kim, L. Blackburn, H. Falcke (2017) *Sub-Millimeter Telescope Calibration Memo 3: A comprehensive look at the absolute amplitude calibration procedure*. Memo CE-2017-03 for the EHT project.

S. Issaoun, T.W. Folkers, L. Blackburn, D.P. Marrone, T. Krichbaum, M. Janssen, I. Marti-Vidal, H. Falcke (2017) *A conceptual overview of single-dish absolute amplitude calibration*. Memo CE-2017-02 for amplitude calibration of EHT observations.

S. Issaoun, T.W. Folkers, H. Falcke (2016) *Sub-Millimeter Telescope Calibration Memo 2: Using 1.3 mm Single-Dish Continuum Observations of April 2016*. Memo CE-2017-01 for the EHT.

S. Issaoun, H. Falcke (2016) *Sub-Millimeter Telescope Calibration Memo 1: Using 1.3 mm Single-Dish Continuum Observations of March 2015*. Memo CE-2016-01 for the EHT project.

**Note: Collaboration memos are supplementary documentation for Event Horizon Telescope operations, analysis and science results hosted on our official website (www.eventhorizontelescope.org/for-astronomers/memos) .*