
CURRICULUM VITAE AND BIBLIOGRAPHY

Sebastian Heinz

Professor of Astronomy

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Research Interests

- *Astrophysical objects:* Compact objects (black holes; neutron stars), X-ray binaries, galaxy clusters, gamma-ray bursts, interstellar and intergalactic medium, interstellar dust
- *Processes:* Non-thermal radiation mechanisms, plasma processes, particle acceleration, dissipation, neutrino and cosmic ray production, shocks, X-ray dust scattering, thermal conduction
- *Methods:* Analytic descriptions of radiation, relativistic fluid mechanics, magneto-hydrodynamics, 3D visualization, X-ray and optical spectroscopy, X-ray dust echo tomography

Professional and Educational History

- 2015-present Professor, University of Wisconsin-Madison
- 2011-present Affiliate Professor (Physics), University of Wisconsin-Madison
- 2016-2020 Chair, Department of Astronomy
- 2011-2015 Associate Professor, University of Wisconsin-Madison
- 2006-2011 Assistant Professor, University of Wisconsin-Madison
- 2003-2006 Chandra Postdoctoral Fellow, Kavli Institute for Space Research, MIT
- 2000-2003 Institute Postdoctoral Fellow, Max-Planck Institut für Astrophysik, Garching, Germany
- 1995-2000 University of Colorado, Boulder: M.S., Ph.D.
- 1992-1995 Universität Tübingen, Germany: undergraduate & graduate Physics
- 1991-1992 Leibniz Kolleg Tübingen, Germany: Studium Generale

Scholarships, Awards, Memberships in Professional Organizations

- 2016-2020 Fluno Bascom Professor of Astrophysics
- 2016 Mid-Career Prize, High Energy Astrophysics Division, American Astronomical Society

- 2015 Vilas Associate Fellowship, UW-Madison
- 2015-2018 Elected member of IAU Commission NC-61 „Supermassive Black Holes, Feedback and Galaxy Evolution”
- 2013-present Member of the American Physical Society
- 2012-present Member of the International Astronomical Union
- 2005-present Member of the American Astronomical Society
- 1995-2000 University of Colorado-Boulder Graduate Fellowship
- 1995-1997 Fulbright Scholar

Invited Presentations

- November 2022 “X-ray Dust Tomography and the Echo from GRB221009A”, invited seminar, Max Planck Institute for Astronomy, Heidelberg, Germany
- August 2022 “Micro- and Macro Transport in Cool Core Galaxy Clusters”, invited talk, 6th Physics of the Intracluster Medium: Theory and Computation Workshop, Copenhagen, Denmark
- May 2022 “Winds from Active Galactic Nuclei”, invited review talk, Midwest Magnetic Fields Workshop, UW-Madison
- March 2022 “A Heat Pump Model for Feedback in Galaxy Clusters”, invited seminar, Washington University, St. Louis, MS
- May 2021 “Jet Feedback in Groups and Clusters”, invited talk, Midwest Magnetic Fields Workshop, UW-Madison
- October 2020 “X-ray Dust Tomography: New Tools in Mapping the Galaxy”, invited colloquium, INAF, Milan, Italy
- October 2019 “X-ray Dust Tomography: New Tools in Mapping the Galaxy”, invited colloquium, University of Colorado, Boulder, CO
- July 2019 “High Energy Astrophysics: Radiative Processes”, invited lectures at Amsterdam ATA Summer School
- May 2019 “Mass loading in relativistic MHD jets”, Midwest Magnetic Field Workshop, Madison, WI
- July 2018 “Radiative Processes in High Energy Astrophysics”, invited lectures at *DARK Summer School*, Copenhagen, Denmark
- June 2018 “Stellar Mass and Supermassive Black Holes in Era of Multi-Messenger Astronomy”, Invited Plenary Lecture at *Astrophysical Frontiers in the Next Decade and Beyond: Planets, Galaxies, Black Holes, and the Transient Universe*, Portland, OR

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- May 2018 “X-ray Dust Tomography: Mapping Magnetic Fields in Clouds One Transient at a Time”, invited talk, Midwest Magnetic Fields Workshop, Madison, WI
 - February 2018 “X-ray Dust Tomography: The New Frontier in Galactic Exploration”, colloquium, Northwestern University
 - October 2017 “X-ray Dust Tomography: The New Frontier in Galactic Exploration”, colloquium, University of Iowa
 - September 2017 “Jet-disk connections and micro quasar jets”, *Strobe-X Science Definition Workshop*, Texas Tech University, Lubbock, TX
 - July 2017 “X-ray Dust Tomography”, invited seminar, Sternwarte Hamburg, Germany
 - June 2017 “Probing jet physics by the interaction of jets with their surroundings”, invited review talk, *European Week of Astronomy and Space Science*, Prague, Czech Republic
 - May 2017 “Shock Accelerated Inhomogeneous Flows in Astrophysics”, invited talk, Midwest Magnetic Fields Workshop, Madison, WI
 - August 2016 “All Curled Up: Shock Accelerated Inhomogeneous Flows in the Intra-Cluster Medium”, invited talk, *The Physics of the Intra-Cluster Medium*, Minneapolis, MN
 - May 2016 “Jets from stellar remnants”, invited review talk, *Stellar Remnants at the Junction*, Junction, TX
 - April 2016 “In the Ring with Circinus X-1: A Three Round Struggle to Reveal Its Secrets” Prize Lecture, 2016 *HEAD Meeting*, Naples, FL
 - March 2016 “Circinus X-1: A Puzzle Solved”, invited lecture, Harvard, Cambridge, MA
 - February 2016 “In the Ring with Circinus X-1: A Three-Round Fight to Reveal its Secrets”, colloquium, Princeton, NJ
 - April 2015 “The Youngest Known X-ray Binary and its Surprising Lesson for Neutron Star Formation”, colloquium, University of Hawaii
 - November 2014 “A Blast from the Past: How Cir X-1 Became the Youngest Known X-ray Binary”, solicited talk, *15 Years of Science with Chandra*, Boston, MA
 - September 2014 “Jets on All Scales”, Invited Opening Lecture, *Extragalactic Jets from Every Angle*, Galapagos Islands, Ecuador
 - August 2014 “AGN Feedback: What the Next Generation of X-ray Telescopes Must Deliver“, invited talk, 2014 *HEAD Meeting*, Chicago
 - July 2014 “Circinus X-1 - A Puzzle Solved”, invited seminar, Max-Planck-Institute for Astrophysics, Garching, Germany

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- June 2014 “Jets on All Scales: A Phenomenological View of Collimated Outflows and Their Importance for Cosmic Structure Formation”, Plenary lecture at the *224th Meeting of the American Astronomical Society*, Boston, MA
 - May 2014 “The Magnetic Field Strength of Young Neutron Stars - a Case for Suppression by Near-Eddington Accretion”, invited talk, *Midwest Magnetic Field Workshop*, Madison, WI
 - January 2014 “Circinus X-1: A Puzzle Solved”, Physics colloquium UW-Madison, Madison, WI
 - December 2013 “The Youngest Known X-ray Binary: Circinus X-1 and its Natal Supernova Remnant”, colloquium, MIT
 - November 2013 “The Youngest Known X-ray Binary: Circinus X-1 and its Natal Supernova Remnant”, colloquium, UC Santa Cruz
 - September 2013 “Manifestations of Scale Invariance in Jets”, invited talk, *Black Hole (g)Astronomy*, Brindisi, Italy
 - July 2013 “Astrophysical Shocks”, invited plenary lecture at *2013 International Shock Symposium 29*, Madison, WI
 - November 2012 “Biting the Hand that Feeds them: Feedback from Supermassive Black Holes”, colloquium, University of Washington, Seattle
 - August 2012 “From Small to Big: Scaling Relations for Accreting Black Holes”, invited review talk, *28th Meeting of the International Astronomical Union*, Beijing, China
 - August 2012 “Numerical Simulations of AGN Feedback in Clusters”, invited review talk, *28th Meeting of the International Astronomical Union*, Beijing, China
 - July 2012 “The Interaction of Microquasars with their Environment”, invited institute seminar, Sternwarte Hamburg, Germany
 - November 2011 “All Curled Up: The Dynamics of Astrophysical Smoke Rings”, invited theory seminar, Canadian Institute for Theoretical Astrophysics, Toronto, Canada
 - November 2011 “Black Hole Exhaust: An Environmental Impact Study of Microquasars”, invited colloquium, National Radio Astronomical Observatory, Socorro, New Mexico
 - June 2011 “The interaction of microquasars with the ISM”, invited seminar, Jabob’s University, Bremen, Germany
 - June 2011 “Running on Fumes: Traces of Jet Feedback and What We Can Learn from Them”, invited talk, *High Energy Phenomena in Relativistic Outflows III*, Barcelona, Spain

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- May 2011 “AGN Jets and Clusters of Galaxies”, invited review talk, *Understanding Relativistic Jets*, Krakow, Poland
 - August 2010 “Feedback in Galaxy Clusters”, invited talk, Cluster Workshop, University of Michigan, Ann Arbor
 - July 2010 “MHD Simulations of Galaxy Cluster Feedback”, invited talk, COSPAR meeting, Bremen, Germany
 - April 2010 “MHD simulations of Galaxy Cluster Physics”, invited talk, Midwest Magnetic Field Workshop, Madison, Wisconsin
 - April 2010 “Black Hole Exhaust: An Environmental Impact Study of Microquasars”, Astronomy seminar, Northwestern University
 - March 2010 “Black Hole Exhaust: An Environmental Impact Study of Microquasars”, colloquium, University of Minnesota, Minneapolis-St. Paul
 - November 2009 “Microquasars and their impact on the ISM”, colloquium, University of Michigan, Ann-Arbor
 - November 2009 “Block holes and their impact on the large scale structure”, colloquium, University of Illinois at Urbana-Champaign
 - October 2009 “Black hole synthesis models and low-luminosity AGN”, *Galactic Center Workshop 2009*, Shanghai
 - October 2009 “Relativistic Jets and their Interaction with the Interstellar Medium”, *CMSO workshop*, Madison-Wisconsin
 - March 2009 “Black hole scatology: The interaction of microquasars with the ISM”, invited high energy seminar, Center for Relativistic Astrophysics, Georgia Tech, Atlanta
 - February 2009 “Black hole scatology: The interaction of microquasars with the ISM”, colloquium, University of Florida, Gainesville
 - February 2009 “Black hole exhaust: An environmental impact study of microquasars”, colloquium, Harvard, Cambridge
 - December 2008 “Black hole scatology: The interaction of microquasars with the ISM”, Theoretical Astrophysics Center Seminar, Berkeley
 - July 2008 “Jet-Disk connections and the central hypothesis”, invited talk, *putting gravity to work: from black holes to clusters*, Cambridge, UK
 - April 2008 “Microquasars and the ISM”, colloquium, University of Virginia
 - January 2008 “Feedback in Galaxy Clusters”, invited review talk, *211th AAS meeting*, Austin, Texas
 - October 2007 “Microquasars and their environment”, invited review talk, *a population explosion: the nature and evolution of X-ray binaries in diverse environments*, St. Petersburg Beach, Florida

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- September 2007 “Microquasars as High Energy Sources - from GLAST to ICE CUBE”, invited review talk, *High Energy Phenomena in Relativistic Jets*, Dublin, Ireland
 - July 2007 “Microquasars as High Energy Sources”, invited high energy seminar, Max-Planck Institute for Nuclear Physics, Heidelberg, Germany
 - April 2007 “Astrophysical Jets as Sources of High Energy Particles”, invited review talk, *Ice Cube workshop*, Lake Geneva, WI
 - October 2006 “Microquasars and their impact on the Galaxy”, invited review talk, 2006 *HEAD meeting*, San Francisco
 - September 2006 “The interaction of Microquasars with the ISM”, invited review talk, *6th Microquasar Workshop*, Como, Italy
 - June 2006 “Microquasar jets and the ambient medium”, invited review talk, conference on *Challenges of Relativistic Jets*, Cracow, Poland
 - March 2006 “Scaling laws for microquasars”, invited talk at Sakler conference on *The history of the nuclear black holes in galaxies*, Harvard University, Massachusetts
 - February 2006 “Jets and the growth of large scale structure”, colloquium, University of Chicago
 - February 2006 “Cosmological Feedback”, colloquium, University of Wisconsin, Madison
 - January 2006 “A jet is a jet, big or small”, colloquium, Purdue University, Indiana
 - January 2006 “Harassing the neighbors - the interaction of jet with their environment”, colloquium, University of Michigan, Ann Arbor
 - November 2005 “The relation between microquasars and AGNs”, invited theory seminar at the Center for Astrophysics, Harvard, Massachusetts
 - October 2005 “The impact of jets on their environment”, invited YCAA seminar at Yale University, Connecticut
 - June 2005 “Harassing the neighbors: The interaction of jets with their environment”, invited review talk, *206th AAS meeting*, Minneapolis
 - March 2005 “Jets from microquasars and intermediate mass black holes”, invited talk at conference on *Relativistic Jets*, Cozumel, Mexico
 - December 2004 “AGN jets in galaxy clusters”, invited seminar at UC Irvine, California
 - December 2004 “Feedback and heating of the IGM by AGN jets”, invited institute seminar at Stanford University, California
 - November 2004 “AGN feedback into the IGM”, invited review talk at workshop on *The Role of Mergers and Feedback in Galaxy Evolution*, Ringberg, Germany
 - September 2004 “A jet is a jet, big or small: Connections between microquasars and AGN jets”, invited colloquium, Penn State University, Pennsylvania

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- July 2004 “Scale invariant jets: from binaries to AGNs”, invited talk at conference on *Accretion on all mass scales*, Amsterdam, Netherlands
 - March 2004 “Jets as tools for cosmology and fundamental physics”, colloquium, MPA, Garching, Germany
 - June 2003 “The termination of relativistic jets”, invited review talk at conference on *Particle Acceleration in Astrophysical Objects*, Cracow, Poland
 - May 2003 “AGN heating in cooling flows”, invited talk at conference on *The Riddle of Cooling Flows in Galaxies and Galaxy Clusters*, Charlottesville, VA,
 - January 2003 “Cosmic rays from microquasars”, invited seminar at Max-Planck-Institute for Nuclear Physics, Heidelberg, Germany
 - December 2002 “Modeling the interaction of relativistic jets with their environments”, invited talk at workshop on *Relativistic Winds and Jets from Compact Objects*, Ringberg, Germany
 - October 2002 “The impact of microquasars on the ISM”, invited colloquium, Astronomy Department, University of Oxford, England
 - January 2002 “Radio Galaxies in Galaxy Clusters: Chandra meets ZEUS”, invited insitute seminar, Institute for Astronomy, Universitaet Tuebingen, Germany
 - February 2000 “The Radio emission from the M87 Jet”, invited presentation, Max-Planck-Institute for Astrophysics, Garching, Germany
 - September 1997 “The Synchrotron Emission from the M87 Jet”, solicited talk at workshop *The Radio Galaxy Messier 87*, Ringberg, Germany

Research Proposals

Successful Theory Research Proposals

- 2022 “Dust Echo Tomography: New Diagnostics for Galactic Dust and Magnetic Fields”, 3 year NSF, P.I: S. Heinz
- 2022 “Heat Pumps in the Hearts of Galaxy Clusters”, NASA Astrophysics Theory Program, P.I: S. Heinz
- 2020 “Heat Pumps in the Heart of Galaxy Clusters”, NASA Chandra theory grant, P.I: S. Heinz
- 2019 “How Galaxies Get their Color”, UW WARF Fall Competition grant, P.I: S. Heinz
- 2017 “Jet Propagation through Messy Media: Radio Mode Feedback Facilitated by Entrainment”, NASA, Astrophysics Theory Program, P.I: S. Heinz
- 2016 Co-I grant “A 3D View of the Coevolutionary History of Black Holes and Galaxies”, 3 year NSF, P.I.: M. Wolf, UW-Madison

- 2014 “Metal Transport in Galaxy Clusters by AGN Jets”, AO15, *Chandra theory grant*, P.I: S. Heinz
- 2014 “Magnetizing a Moving Mesh“, UW WARF Fall Competition, P.I: S. Heinz
- 2013 Co-I grant “Experimental and Numerical Investigation of Reactive Shock-Accelerated Flows”, 3 year DOE, (P.I.: R. Bonazza, UW-Madison)
- 2011 “Black Hole Exhaust: Feedback and the Role of Radio Plasma in Galaxy Clusters”, 3 year NSF, P.I: S. Heinz
- 2009 “Like a Candle in the Wind: The Interaction of Microquasar Jets with the Circumbinary Medium”, 3 year NSF, P.I: S. Heinz
- 2009 “Observing the shocked shell of Cygnus X-1”, WARF Fall Competition
- 2009 “The Monster’s Fiery Breath”, NSF conference grant (CoPI with E. Wilcots)
- 2008 “Shaken, then stirred: The interaction of sound waves with X-ray cavities and bubbles in galaxy clusters”, AO10, *Chandra theory grant*
- 2008 “From hot spots to shocked shells: The interaction of microquasars with the ISM”, AO10, *Chandra theory grant*, P.I: S. Heinz
- 2007 “Shocking the Cradle: Jet Induced Feedback in Galaxy Clusters from Growing Black Holes”, 3 year NSF, P.I: S. Heinz
- 2004 “The answer is blowing in the wind: simulations of jets in non-spherical clusters of galaxies”, AO6, *Chandra theory grant*, P.I: S. Heinz

Successful Observing Proposals

- 2021-2023 “Light Echoes from X-ray Transients as Probes of Interstellar Dust and Galactic Structure”, *Chandra* and *Swift* TOO, not yet triggered, P.I: S. Heinz
- 2016-2020 “Putting a Ring on it: Light Echoes from X-Ray Transients as Probes of Interstellar Dust and Galactic Structure”, *Chandra* and *Swift* TOO, 135ksec (triggered in 2019), P.I: S. Heinz
- 2017-2020 “A Blast from the Past: Exploring the Supernova Remnant of Cir X-1, the Youngest Known X-ray Binary“, *Chandra* TOO, 180ksec (not yet triggered), P.I: S. Heinz
- 2015 “A Blast from the Past: Exploring the Supernova Remnant of Cir X-1, the Youngest Known X-ray Binary“, *Chandra* TOO, 180ksec, P.I: S. Heinz
- 2015 “Light Echoes from V404 Cyg”, *Chandra*, Director’s Discretionary Time, 30ksec, P.I: S. Heinz
- 2015 “Observing the Light Echo from Cir X-1’s 2015 flare”, *Swift*, 2ksec

- 2014 “An Unprecedented Dust Echo Around Circinus X-1”, XMM-Newton, Director’s Discretionary Time, 90ksec, P.I: S. Heinz
- 2013 “Turning Down the Noise on Circinus X-1”, AO15, Chandra ToO observation, 200ksec, P.I: S. Heinz
- 2008 “From hot spots to shocked shells: The interaction of microquasars with the ISM”, AO10, *Chandra theory proposal*, 100 ksec, P.I.: S. Heinz
- 2008 “Hot on the trail of Circinus X-1: The first X-ray jet from an accreting neutron star”, AO10, *Chandra*, 100 ksec, P.I.: S. Heinz
- 2008 “Setting a speed trap for Cyg X-1: Measuring jet power and ISM density”, WIYN, 3 nights, P.I: S. Heinz
- 2006 “Setting a speed trap for Cyg X-1: Measuring jet power and ISM density”, WIYN, 1 night, P.I: S. Heinz
- 2006 “The ring of fire: Constraining the jet power of Cygnus X-1 from its shocked shell”, AO8, *Chandra*, 50 ksec, P.I.: S. Heinz
- 2006 “A snapshot X-ray/radio survey of AGNs selected from the long menu of SDSS”, AO8, *Chandra*, 200 ksec, P.I.: S. Heinz
- 2004 “Observing the infrared jet of Cyg X-1”, AO1, *Spitzer Space Telescope*, 2.1hrs, P.I.: S. Heinz
- 2002 “RXTE Observations of X1822-37”, *RXTE*, 120 ksec, P.I.: S. Heinz

Successful Supercomputer Allocation Proposals

- 2022 ACCESS allocation of 79,000 Node Hours on Stampede 2 (TACC)
- 2022 NASA Pleiades allocation of 300,000 Service Units (HECC)
- 2019 XSEDE allocation of 102,470 Service Units on Stampede 2 (TACC)
- 2018 XSEDE allocation of 45,455 Service Units on Stampede 2 (TACC)
- 2017 XSEDE allocation of 63,869 Service Units on Stampede 2 (TACC)
- 2015 XSEDE allocation of 1,038,499 CPU hours on Stampede (TACC)
- 2014 XSEDE allocation of 1,022,689 CPU hours on Stampede (TACC)

Teaching and Outreach

Advising

- 2006-present **Postdoctoral scholars:**
Lia Corrales, Einstein Fellow, 2016-2018
Brian Morsony, NSF Fellow, 2008-2014
David Pooley, 2006-2008

- 2006-present **Ph.D. students**
Yiting Wang, 2022-present
Jennifer Stafford, 2019-present
Yi-Hao Chen, 2013-2019
Gandhari Wattal, 2013-2019
DooSoo Yoon, 2009-2015
Paul Sell, 2007-2013
Samuel Friedman, 2006-2011
- 2006-present **Masters students**
Teva Ilan, 2018-2021
- 2007-present **Undergraduate students (UW-Madison)**
William Jarvis, 2021-present
Andrew Mark Heinrich, 2018-present
Matthew Alessi Ruffner, 2018-2019
Doreen Beeler, 2017-2019
Brianna Mills, 2017, REU (Chambliss Winner)
David Carr, 2014-2016
Jake Miller, 2010-2012
Emily Richards, 2011, REU
- 2004-2006 **Undergraduates (MIT)**
Emily Levesque, 2005-2006
Josiah Schwab, 2005-2006

Courses Taught

- Astronomy 103 “Exploration of the Universe”: 2019, 2020
- Astronomy 104 “Exploration of the Solar System”, 2010-2013
- Astronomy 113 “The Hands-On Universe” lab course, 2006
- Astronomy 160 “Life in the Universe”, 2018, 2019, 2020
- Astronomy 335 “Cosmology”, 2008
- Astronomy 700 “Basic Astrophysics I: Radiative Processes in Astrophysics”: 2007-2013, 2015-2020, 2022
- Astronomy 702 “Basic Astrophysics II: Dynamical Processes in Astrophysics”: 2016, 2021, 2023
- Physics 772 “High Energy Astrophysics”, 2009, 2014
- Astronomy 910 “Topics in Astronomy Seminar”: 2017, 2018, 2019

Media Coverage and Outreach

- 2022 [NASA image release](#) of Chandra data on V404 Cyg light echo

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- 2022 [Interview](#) on Channel 3000 CBS afternoon news on EHT image of Sgr A*
 - 2022 [Interview with NPR](#) on EHT image of Sgr A*
 - 2021 Public [YouTube Lecture](#) on “Röntgen-Echo-Tomographie und interstellarer Staub” as part of “Faszination Astronomy Online” at “Haus der Astronomie” in Heidelberg, Germany
 - 2019 Interview on NPR’s Central Time on EHT image of M87 black hole
 - 2019 Interview on WORT on EHT image of M87 black hole
 - 2018 [Interview on NPR’s Central Time](#) on the occasion of the death of Stephen Hawking
 - 2016 [Interview for UW News](#) about the MSO “The Planets: An HD-Odyssey” and hosting MSO at Washburn observatory
 - 2016 Represented “Friends of UW-Madison Astronomy” as co-sponsors of “[The Planets: An HD Odyssey](#)” at Overture
 - 2016 Interview on NPR’s Central Time about gravitational wave astronomy
 - 2016 Appearance on WPR’s “Whadda’Ya Know”, discussing gravitational wave astronomy
 - 2015 Joint NASA / [Chandra X-ray Center](#) / [UW-Madison](#) press release on the Giant X-ray Light Echo of Circinus X-1
 - 2015 TIME top 10 space photos of 2015
 - 2015 [Astronomy Picture of the Day](#), 2015, NASA
 - 2014 Speaker at UW-Soundwaves, “Metals in Space”, Wisconsin Institutes for Discovery
 - 2013 Featured in [Slate article](#) by Phil Plait
 - 2013 Joint [NASA](#) / [Chandra X-ray Center](#) / [UW-Madison](#) press release on the detection of the supernova remnant of the youngest known X-ray binary, Circinus X-1
 - 2013 Host / principal lecturer of 10 week / 20 hour UW PLATO public lecture series on “Cosmology” (UW Space Place)
 - 2012 Volunteer at public open house events for Venus Transit
 - 2011 Host / principal lecturer of 10 week / 20 hour UW PLATO public lecture series on “Planets: Foreign Worlds” (UW Space Place)
 - 2011 Public lecture Verona Public Library
 - 2011 Public lecture at 47th Annual Wisconsin Mathematics, Engineering, and Science Talent Search Honors Day
 - 2009 Principal Investigator of public virtual X-ray observatory code XIM for visualization of numerical fluid dynamical simulations

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- 2009 Host / principal lecturer of 10 week / 20 hour UW PLATO public lecture series on “Black Holes” (UW Space Place)
 - 2008-present Frequent public lecturer at UW Space Place
 - 2008 Public lecturer on Black Holes at UW Fall Day, filmed and broadcast on Wisconsin Public Television’s “University Place” and available for streaming on WPT web site
 - 2008 PI for SEED grant proposal to the Astronomical Society of the Pacific to support outreach at UW Space Place
 - 2007 NASA [Chandra X-ray Center](#) / [UW Madison](#) joint press release on the first detected X-ray jet from a Neutron star X-ray binary
 - 2007 Participant in STEMES/CIRTL workshop, Howard University
 - 2005 Teacher and co-organizer at “Chandra Astrophysics Institute”: Four week summer program for local High School students (funded by *Chandra* EPO proposal)

Academic Service

Department Committees

- Advisory Committee, Living Galaxy ODI project (2009-2010)
- Associate Department Chair (2013-2014, 2015-2016, 2020-2021)
- Board of Visitors Liaison (2018-2019, 2022-2023)
- Compensation Committee, Chair (2016-2020)
- Compensation Committee (2013-2014, 2015-2016)
- Computing Committee, Chair (2009-2013)
- Curriculum Committee (2016-2020)
- Department Chair (2016-2020)
- Director of Washburn Labs (2019-2020)
- Faculty Mentoring Committee, Grier (2022-2023)
- Faculty Mentoring Committee, Beatty, Chair (2022-2023)
- Faculty Mentoring Committee, Vanderburg (2020-2021)
- Faculty Mentoring Committee, D’Onghia, Chair (2011-2013)
- Faculty Mentoring Committee, Tremonti (2011-2012)
- Faculty Search Committee, Multi-Messenger Astronomy Cluster, Chair (2022-2023)
- Faculty Search (2018-2019)
- Faculty Search, Chair (2010-2011)
- Graduate Admissions, Chair (2012-2013, 2020-2021)
- Graduate Admissions (2006-2008, 2015-2016)
- Graduate Curriculum (2006-2007)
- Newsletter Editor (2017-2019)

- Preliminary Exam Committee (2016-2017, 2018-2019)
- Promotion Committee Townsend, Chair (2019-2020)
- Search Committee, Graduate Coordinator, Chair (2018-2019)
- Search Committee, Development Specialist (2010-2011)
- Search Committee, System Administrator, Chair (2010-2011)
- Social Media and PR Committee (2016-2020)
- Strategic Planning, Chair (2016-2020)
- Strategic Planning (2008-2009)
- Telescope Futures Committee (2012-2013)
- Telescope Time Allocation (2011-2012)
- Tenure Committee, D'Ongia (2016-2017)
- Tenure Committee, Widicus-Weaver (2020-2021)
- Time Allocation Redesign (2009-2010)
- Web redesign Committee, Chair (2009-2016)
- WIYN time allocation committee (2016-2018)

University Committees

- 43 Ph.D. Exam Committees in Astronomy and Physics at UW-Madison (2006-present)
- Academic Program Review, Computer Science (2015-2016)
- Alternate Faculty Senate Representative (2006-2008)
- Alternate AURA Representative (2019-2023)
- Faculty Senate Representative (2019-2020)
- Graduate School/VCRGE Research Committee (2012-2015)
- WiCOR Planning Committee, Astronomy Representative (2022-2023)

Professional Service

- 2006-present Regular member on review panels (including NSF, NASA, Canadian Research Council, Austrian Research Foundation, Deutsche Forschungsgesellschaft)
- 1999-present Regular referee for Astrophysical Journal, Astrophysical Letters, Astronomical Journal, Monthly Notices of the Royal Astronomical Society, Nature, Nature Astronomy, Astronomy & Astrophysics, and Science
- 2019-2020 Member of the SOC for “Extragalactic jets on all scales - launching, propagation, termination”, 2020, Heidelberg, Germany
- 2015 Member of the SOC for “X-ray Vision: Probing the Universe in Depth and Detail“, 2015, Washington, DC
- 2013 External Ph.D. Exam Committee Member, University of Waterloo, Canada
- 2009-2010 Member of the SOC for the “Great Lakes Cosmology Workshop” 2010, Chicago, Illinois

- 2008-2009 PI and member of executive committee/LOC/SOC for UW-Madison conference on “The Monster’s Fiery Breath: Feedback in galaxies, groups, and clusters” (June 2009)
- 2008 Member of the SOC, conference “Radio Galaxies in the Chandra Era”, Cambridge, MA
- 2006 Organizer for weekly UW-Madison coffee/tea/astro-ph meetings
- 2001-2003 Co-organizer for German node in EU Research & Training Network “Gamma Ray Bursts - an Enigma and a Tool”
- 2002 Member of the SOC for the conference "The Physics of Relativistic Jets in the Chandra/XMM Era", 23-27 September 2002, Bologna, Italy
- 2001 Member of the SOC/LOC for the "Ringberg workshop on Relativistic Jets", 5-7 September 2001, Ringberg Castle, Germany

External Advisory Boards and Review Panels

- 2019-present Member of NASA Athena-NAST advisory panel
- 2023 ██████████ Panel Review
- 2022 NASA ██████████ Time Allocation Peer Review, Deputy Chair
- 2022 NASA ██████████ Time Allocation Peer Review Panel, Chair
- 2015-2022 NASA-selected representative to Athena Science Definition Team Panel
- 2021 NASA ██████████ Time Allocation Peer Review Panel, Chair
- 2020-2021 NRAO Science Review Panel
- 2019 NASA ██████████ Review Panel
- 2019 NASA Senior Review, Chandra X-ray Observatory
- 2017 NASA ██████████ Review Panel, Chair
- 2016 NASA Senior Review, Chandra X-ray Observatory
- 2016 Pundit at large at 2016 NASA ██████████ Time Allocation Peer Review
- 2015-2016 X-Ray Surveyor Informal Definition Team
- 2014 NASA Senior Review, Main Missions
- 2013-2014 Member of NASA X-Ray Astrophysics Probe Science and Technology Definition Team
- 2012-2014 Member of Athena and Athena+ Science Team Panel for AGN feedback in galaxy clusters
- 2007-2011 Member of Constellation-X / IXO Science Team Panel on feedback and cluster physics
- 2009 NASA ██████████ Time Allocation Peer Review

- 2007-2009 Member of AUI committee on Radio Astronomy Futures, with advisory function for the 2010 Decadal Survey
- 2005 NASA ██████████ Time Allocation Peer Review

Bibliography

- Total Citations (Astrophysics Data System): 6891
- H-Index (Astrophysics Data System): 42
- Students and postdocs of Prof. Heinz are listed as underlined>.
- A full electronic list of Prof. Heinz's publication record with access to citation counts can be viewed on the [Astrophysics Data System](#) and [Google Scholar](#).

Publications in Refereed Journals

1. “GRB 221009A: Discovery of an Exceptionally Rare Nearby and Energetic Gamma-Ray Burst”, Williams, M.A., Kennea, J.A., Dichiara, S., Kobayashi, K., Iwakiri, W.B., Beardmore, A.P., Evans, P. A., **Heinz, S.**, Lien, A., Oates, S. R., Negoro, H., Cenko, S.B., Buisson, D.J.K., Hartmann, D.H., Jaisawal, G.K., Kuin, N.P.M., Lesage, S., Page, K.L. , Parsotan, T., Pasham, D.R., Sbarufatti, B., Siegel, M.H., Sugita, S., Younes, G., Ambrosi, E., Arzoumanian, Z., Bernardini, M.G., Campana, S., Capalbi, M., Caputo, R., D’Ai, A., D’Avanzo, P., D’Elia, V., De Pasquale, M., Eyles-Ferris, R.A.J., Ferrara, E., Gendreau, K.C., Gropp, J.D., Kawai, N., Klingler, N., Laha, S., Melandri, A., Mihara, T., Moss, M., O’Brien, P., Osborne, J.P., Palmer, D.M., Perri, M., Serino, M., Sonbas, E., Stamatikos, M., Starling, R., Tagliaferri, G., Tohuvaohu, A., Zane, S., Ziaepour, H., 2023, *Astrophysical Journal*, accepted for publication
2. “Short Timescale Evolution of the Polarized Radio Jet during V404 Cygni's 2015 Outburst”, Hughes, A. K., Sivakoff, G. R., Macpherson, C. E., Miller-Jones, J. C. A., Tetarenko, A. J., Altamirano, D., Anderson, G. E., Belloni, T. M., **Heinz, S.**, Jonker, P. G., Körding, E. G., Maitra, D., Markoff, S. B., Migliari, S., Mooley, K. P., Rupen, M. P., Russell, D. M., Russell, T. D., Sarazin, C. L., Soria, R. 2023, *Monthly Notices of the Royal Astronomical Society*, in press
3. “On the relative importance of AGN winds for the evolution of exoplanet atmospheres”, **Heinz, S.**, 2022, *Monthly Notices of the Royal Astronomical Society*, 513,4669
4. “How Does Environment Affect the Morphology of Radio AGN?”, Morris, M., Wilcots, E., Hooper, E., & **Heinz, S.**, 2022, *Astronomical Journal*, 163, 280
5. “Constraining Black Hole Feedback in Galaxy Clusters from X-ray Power Spectra”, Heinrich, A., Chen, Yi-Hao, **Heinz, S.**, Zhuravleva, I., Churazov, E., 2021, *Monthly Notices of the Royal Astronomical Society* 505, 4646

6. “Rapid compact jet quenching in the Galactic black hole candidate X-ray binary MAXI J1535-571”, T D Russell, M Lucchini, A J Tetarenko, J C A Miller-Jones, G R Sivakoff, F Krauß, W Mulaudzi, M C Baglio, D M Russell, D Altamirano, C Ceccobello, S Corbel, N Degenaar, J van den Eijnden, R Fender, **S Heinz**, K I I Koljonen, D Maitra, S Markoff, S Migliari, A S Parikh, R M Plotkin, M Rupen, C Sarazin, R Soria, R Wijnands, 2020, Monthly Notices of the Royal Astronomical Society 498, 5772
7. “The Origins of the Line Emissions in Circinus X-1 at Very Low X-Ray Flux”, Schulz, N., Kallman, T.E., **Heinz, S.**, Sell, P., Jonker, P., & Brandt, W.N., 2020, Astrophysical Journal 2891, 150
8. “Jets, Bubbles, and Heat Pumps in Galaxy Clusters”, Chen, Y.H., **Heinz, S.**, and Ensslin, T., 2019, Monthly Notices of Royal Astronomical Society, 489, 1939
9. “Tracking the variable jets of V404 Cygni during its 2015 outburst”, Tetarenko, A., Sivakoff, G., Miller-Jones, J., Bremer, M., Mookey, M., Fender, R., Altamirano, D., **Heinz, S.**, Maitra, D., Markoff, S., Migliari, S., Rupen, M., Russell, D., Sarazin, C., 2019, Monthly Notices of the Royal Astronomical Society, 482, 2950
10. “The X-ray Variable Sky as Seen by MAXI: The Future of Dust-echo Tomography with Bright Galactic X-ray Bursts”, Corrales, L., Mills, B., **Heinz, S.**, Williger, G., 2019, Astrophysical Journal, 874, 155
11. “Extreme jet ejections from the black hole X-ray binary V404 Cygni”, Tetarenko, A. J.; Sivakoff, G. R.; Miller-Jones, J. C. A.; Rosolowsky, E. W.; Petitpas, G.; Gurwell, M.; Wouterloot, J.; Fender, R.; **Heinz, S.**; Maitra, D.; Markoff, S. B.; Migliari, S.; Rupen, M. P.; Rushton, A. P.; Russell, D. M.; Russell, T. D.; Sarazin, C. L., 2017, Monthly Notices of the Royal Astronomical Society, 469, 3141
12. “Partitioning the Outburst Energy of a Low Eddington Accretion Rate AGN at the Center of and Elliptical Galaxy: the Recent 12 Myr History of the Supermassive Black Hole in M87”, Forman, W., Churazov, E., **Heinz, S.**, Kraft, R., Jones, C., 2017, Astrophysical Journal, 844, 122
13. “Bow-shock Pulsar Wind Nebulae Passing Through Density Discontinuities”, Yoon, D.S., **Heinz, S.**, 2017 Monthly Notices of the Royal Astronomical Society, 464, 3297
14. “The 2015 Decay of the Black Hole X-ray Binary V404 Cygni: Robust Disk-Jet Coupling and a Sharp Transition into Quiescence”, R. M. Plotkin, J. C. A. Miller-Jones, E. Gallo, P. G. Jonker, J. Homan, J. A. Tomsick, P. Kaaret, D. M. Russell, **S. Heinz**, E. J. Hodges-Kluck, S. Markoff, G. R. Sivakoff, D. Altamirano, J. Neilsen, 2017, Astrophysical Journal, 834, 104
15. “The reproducible radio outbursts of SS Sign”, Russell, T.D., Miller-Jones, J.C.A., Sivakoff, G.R., Altamirano, D., O'Brien, T. J., Page, K. L., Templeton, M. R.,

- Körding, E. G., Knigge, C., Rupen, M. P., Fender, R. P., **Heinz, S.**, Maitra, D., Markoff, S., Migliari, S., Remillard, R. A., Russell, D. M., Sarazin, C. L., Waagen, E. O., 2016, Monthly Notices of the Royal Astronomical Society, 460, 3720
16. “A Joint Chandra and Swift View of the 2015 X-ray Dust Scattering Echo of V404 Cygni”, **Heinz, S.**, Corrales, L., Smith, R., Brandt, W.N., Jonker, P., Plotkin, R., Neilsen, J., 2016, Astrophysical Journal, 825, 15
 17. “Formation of recollimation shocks in jets of high-mass X-ray binaries”, Yoon, D.S., Zdziarski, A., **Heinz, S.**, 2016, Monthly Notices of the Royal Astronomical Society, 456, 3638
 18. “Radio Monitoring of the Hard-State Jets in the 2011 Outburst of MAXI J18360194”, Russell, T. D.; Miller-Jones, J. C. A.; Curran, P. A.; Soria, R.; Altamirano, D.; Corbel, S.; Coriat, M.; Moin, A.; Russell, D. M.; Sivakoff, G. R.; Slaven-Blair, T. J.; Belloni, T. M.; Fender, R. P.; **Heinz, S.**; Jonker, P. G.; Krimm, H. A.; Körding, E. G.; Maitra, D.; Markoff, S.; Middleton, M.; Migliari, S.; Remillard, R. A.; Rupen, M. P.; Sarazin, C. L.; Tetarenko, A. J.; Torres, M. A. P.; Tudose, V.; Tzioumis, A. K., 2015, Monthly Notices of the Royal Astronomical Society, 450, 1745
 19. “Lord of the Rings: A Kinematic Distance to Circinus X-1 from a Giant X-ray Light Echo”, **Heinz, S.**, Burton, M., Braiding, C., Brandt, W.N., Jonker, P.G., Sell, P., Fender, R.P., Nowak, M.A., Schulz, N.S., 2015, Astrophysical Journal 806, 265
 20. “Sub-mm Jet Properties of the X-ray Binary Swift J1745-26”, Taratarnko, A.J., Sivakoff, G.R., Miller-Jones, J.C.A., Curran, P.A., Russell, T.D., Coulson, I.M., **Heinz, S.**, Maitra, D., Markoff, S.B., Migliari, S., Petitpas, G.R., Rupen, M.O., Rushton, A.P., Russell, D.M., Sarazin, C.L., 2015, Astrophysical Journal, 805,30
 21. “Global Simulations of the Interaction of Microquasar Jets with a Stellar Wind in High-Mass X-ray Binaries“, Yoon, D., **Heinz, S.**, 2015, Astrophysical Journal 801, 55
 22. “Shell-Shocked: The Interstellar Medium Near Cygnus X-1”, Sell, P., **Heinz, S.**, Richards, E., Maccarone, T.J., Russell, D.M., Gallo, E., Fender, R., Markoff, S., Nowak, M., 2015, Monthly Notices of the Royal Astronomical Society, 446, 3579.
 23. “Massive Compact Galaxies with High-Velocity Outflows: Morphological Analysis and Constraints on AGN Activity”, Sell, P., Tremonti, C., Hickox, R., Diamond-Stanic, A., Moustakas, J., Coil, A., Williams, A., Rudnick, G., Robaina, A., Geach, J., **Heinz, S.**, Wilcots, E., 2014, Monthly Notices of the Royal Astronomical Society, 441, 3417
 24. “The Youngest Known X-ray Binary: Circinus X-1 and its Natal Supernova Remnant”, **Heinz, S.**, Sell, P., Fender, R.P., Jonker, P., Brandt, W.N., Calvelo-Santos, D.E., Tzioumis, A.K., Nowak, M.A., Schulz, N.S., Wijnands, R., van der Klis, M., 2013, Astrophysical Journal, 779, 171

25. “Multiwavelength Observations of the SS 433 Jets”, Marshall, H., Canizares, C., Hillwig, T., Mioduszewski, A., Rupen, M., Schulz, N., Nowak, M., & **Heinz, S.**, 2013, *Astrophysical Journal*, 775, 75
26. “Simulations of Bent-Double Radio Sources in Galaxy Groups”, Morsony, B., Miller, J., Heinz, S., Freeland, E., Wilcots, E., Brueggen, M., & Ruszkowski, M., 2013, *Monthly Notices of the Royal Astronomical Society*, 431, 781
27. “An Evolving Compact Jet in the Black Hole X-Ray Binary MAXI J1836-194”, Russell, D., Russell, T., Miller-Jones, J., O’Brien, K., Soria, R., Sivakoff, G., Slaven-Blair, T., Lweis, F., Markoff, S., Homan, J., Altamirano, D., Curran, P., Rupen, M., Belloni, T., Cadolle Bel, M., Casella, P., Corbel, S., Dhawan, V., Fender, R., Gallo, E., Gandhi, P., **Heinz, S.**, Koerding, E., Krimm, H., Maitra, D., Migliari, S., Remillard, R., Sarazin, C., Shahbaz, T., Tundo, V., *The Astrophysical Journal Letters*, 2013, L35, 6
28. “Disk-Jet Coupling in the 2009 Outburst of the Black Hole Candidate H1743-322”, Miller-Jones, J.C.A., Sivakoff, G.R., Altamirano, D., Coriat, M., Corbel, S., Dhawan, V., Krimm, H.A., Remillard, R., Rupen, M.P., Russell, D.M., Fender, R.P., **Heinz, S.**, Koerding, E.G., Maitra, D., Markoff, S., Migliari, S., Sarazin, C.L., & Tundo, V., 2012, *Monthly Notices of the Royal Astronomical Society*, 421, 468
29. “All Curled Up: A Numerical Investigation of Shock-Bubble Interactions and the Role of Vortices in Heating Galaxy Clusters”, Friedman, S., Heinz, S., & Churazov, E., 2012, *Astrophysical Journal*, 746, 112
30. “Jet Trails and Mach Cones: The Interaction of Microquasars with the ISM”, Yoon, D., Morsony, B., Heinz, S., Wiersma, K., Fender, R.P., Russell, D., & Sunyaev, R., 2011, *Astrophysical Journal*, 742, 25
31. “XIM - A Virtual X-ray Observatory: Investigating the X-ray Appearance and Line Profile Function of Vortex Rings in Galaxy Clusters”, **Heinz, S.**, Brueggen, M., & Friedman, S., 2011, *Astrophysical Journal Supplements*, 194, 21
32. “Testing Black Hole Jet Scaling Relations in Low Luminosity Active Galactic Nuclei”, de Gasparin, F., Merloni, A., Sell, P., Best, P., **Heinz, S.**, & Kauffman, G., 2011, *Monthly Notices of the Royal Astronomical Society*, 415, 2910
33. “A Multiwavelength Study of Cygnus X-1: The First Mid-Infrared Spectroscopic Detection of Compact Jets”, Rahoui, F., Lee, J.C., **Heinz, S.**, Hines, D., Pottschmidt, K., Wilms, J., & Grinberg, V., 2011, *Astrophysical Journal*, 736, 63
34. “Luminosity Functions and Point Source Properties from Multiple Chandra Observations of M81”, Sell, P., Pooley, D., Zezas, A., **Heinz, S.**, Homan, J., & Lewin, W.H.G., 2011, *Astrophysical Journal*, 735, 26

35. “Parsec-Scale Bipolar X-Ray Shocks Produced by Powerful Jets from the Neutron Star Circinus X-1”, Sell, P., **Heinz, S.**, Calvelo, D.E., Tudose, V., Soleri, P., Fender, R.P., Jonker, P.G., Schulz, N., Brandt, W.N., Nowak, M., Wijnands, R., van der Klis, M., & Cacella, P., 2010, *Astrophysical Journal Letters*, 719, L194
36. “Swimming Against the Current: Simulations of Central AGN Evolution in Dynamic Galaxy Clusters”, Morsony, B., **Heinz, S.**, Brueggen, M., & Ruszkowski, M., 2010, *Monthly Notices of the Royal Astronomical Society*, 407, 1277
37. “Prospects of High-Resolution X-ray Spectroscopy for Active Galactic Nucleus Feedback in Galaxy Clusters”, **Heinz, S.**, Brueggen, M., & Morsony, B., 2010, *Astrophysical Journal*, 708, 462
38. “Evolution of the Radio-X-Ray Coupling Throughout an Entire Outburst of Aquila X-1”, Miller-Jones, J.C.A., Sivakoff, G.R., Altamirano, D., Tudose, V., Migliari, S., Dhawan, V., Fender, R.P., Garrett, M.A., **Heinz, S.**, et al., 2010, *Astrophysical Journal*, 716, 109
39. “The Complete Spectrum of the Neutron Star X-ray Binary 4U 0614+091”, Migliari, S., Tomsick, J.A., Miller-Jones, J.C.A., **Heinz, S.**, Hynes, R.I., Fender, R.P., Gallo, E., Jonker, P.G., & Maccarone, T.J., 2010, *Astrophysical Journal*, 710, 117
40. “Evolution of X-ray Cavities”, Brueggen, M., Scannapieco, E., & **Heinz, S.**, 2009, *Monthly Notices of the Royal Astronomical Society*, 395, 2210
41. “Discovery of a large and bright bow shock nebula associated with low mass X-ray binary SAXJ1712.6-3739”, Wiersma, K., Russell, D., Degenaar, N., Klein-Wolt, M., Wijnands, R., **Heinz, S.**, Read, A., Saxton, R., & Tanvir, N. 2009, *Monthly Notices of the Royal Astronomical Society*, 397, L6
42. “A Parsec scale X-ray extended structure from the X-ray binary Circinus X-1”, Soleri, P., **Heinz, S.**, Fender, R., Wijnands, R., Tudose, V., Altamirano, D., Jonker, P., van der Klis, M., Kuiper, L., Kaiser, C., Casella, P., 2008, *Monthly Notices of the Royal Astronomical Society*, 397, L1
43. “A synthesis model for AGN evolution: supermassive black holes growth and feedback modes”, Merloni, A. & **Heinz, S.**, 2008, *Monthly Notices of the Royal Astronomical Society*, 388, 1011
44. “A Deep Chandra Observation of Abell 4059: A New Face to ‘Radio-Mode’ AGN Feedback?”, Reynolds, C.S., Casper, E., & **Heinz, S.**, 2008, *Astrophysical Journal*, 679, 1181
45. “Blazing Trails: Microquasars as head-tail sources and the seeding of magnetized plasma into the ISM”, **Heinz, S.**, Grimm, H.J., Sunyaev, R.A., & Fender, R., 2008, *Astrophysical Journal*, 686, 1145

-
46. “Evidence of a Parsec-Scale X-Ray Jet from the Accreting Neutron Star Circinus X-1”, **Heinz, S.**, Schulz, N., Brandt, N., & Galloway, D., 2007, *Astrophysical Journal Letters*, 663, L93
 47. “The kinetic luminosity function of AGN jets and the efficiency of jet production by growing black holes”, **Heinz, S.**, Merloni, A., & Schwab, J., 2007, *Astrophysical Journal Letters*, 658, L9
 48. “Measuring the kinetic power of AGN in the radio mode”, Merloni, A. & **Heinz, S.**, 2007, *Monthly Notices of the Royal Astronomical Society*, 381, 589
 49. “Shock heating by Fanaroff-Riley type I radio sources in galaxy clusters”, Brüggén, M., **Heinz, S.**, Roediger, E., Ruszkowski, M., Simionescu, A., 2007, *Monthly Notices of the Royal Astronomical Society Letter*, 380, L67
 50. “Filaments, Bubbles, and Weak Shocks in the Gaseous Atmosphere of M87”, Forman, W., Jones, C., Churazov, E., Markevitch, M., Nulsen, P., Vikhlinin, A., Begelman, M., Böhringer, H., Eilek, J., **Heinz, S.**, Kraft, R., Owen, F., Pahre, M., *Astrophysical Journal*, 2007, 665, 1057
 51. “Morphology of fossil bubbles in magnetized intracluster medium”, Ruszkowski, M., Ensslin, T., Brüggén, M., **Heinz, S.**, & Pfrommer, C., 2007, *Monthly Notices of the Royal Astronomical Society*, 378, 662
 52. “The answer is blowing in the wind: Simulating the interaction of jets with dynamic cluster atmospheres”, **Heinz, S.**, Brüggén, M., Young, A., & Levesque, E., 2006, *Monthly Notices of the Royal Astronomical Society*, 373, L65
 53. “Composition, collimation, contamination: The jet of Cygnus X-1”, **Heinz, S.**, 2006, *Astrophysical Journal*, 636, 316
 54. “A radio-emitting outflow in the quiescent state of A0620-00: implications for modelling low-luminosity black hole binaries”, Gallo, E., Fender, R.P., Miller-Jones, J.C.A., Merloni, A., Jonker, P.G., **Heinz, S.**, Maccarone, T., & van der Klis, M., 2006, *Monthly Notices of the Royal Astronomical Society*, 370, 1351
 55. “Why the fundamental plane of black hole activity is not simply a distance driven artifact”, Merloni, A., Koerding, E., **Heinz, S.**, Markoff, S., Di Matteo, T., & Falcke, H., 2006, *NewA*, 11, 567
 56. “Heating the bubbly medium of galaxy clusters with weak shocks and sound waves”, **Heinz, S.** & Churazov, E., 2005, *Astrophysical Journal Letters*, 634, L141
 57. “Estimating the kinetic luminosity function of X-ray binaries”, **Heinz, S.** & Grimm, H.J., 2005, *Astrophysical Journal*, 633, 384

-
58. “Reflections of AGN outbursts in the gaseous atmosphere of M87”, Forman, W., Nulsen, P., **Heinz, S.**, Owen, F., Eilek, J., Vikhlinin, A., Markevitch, M., Kraft, R., Churazov, E., & Jones, C., 2005, *Astrophysical Journal*, 635, 894
 59. “A dark jet dominates the power output of the stellar black hole Cygnus X-1”, Gallo, E., Fender, R., Kaiser, C., Russell, D., Morganti, R., Oosterloo, T., **Heinz, S.**, 2005, *Nature*, 436, 819
 60. “Is the IR coincidence just that?”, Nowak, M.A., Wilms, J., **Heinz, S.**, Pooley, G., Pottschmidt, K., & Corbel, S., 2005, *Astrophysical Journal*, 626, 1006
 61. “The halo, hot spots and jet/cloud interaction of PKS 2153-69”, Young, A., Wilson, A., Tingay, S., & **Heinz, S.**, 2005, *Astrophysical Journal*, 622, 830
 62. “Constraints on the role of synchrotron X-rays from jets of accreting black holes”, **Heinz, S.**, 2004, *Monthly Notices of the Royal Astronomical Society*, 355, 835
 63. “Constraints on relativistic beaming from estimators of the unbeamed flux”, **Heinz, S.**, & Merloni, A., 2004, *Monthly Notices of the Royal Astronomical Society*, 355, L1
 64. “Long term variability of Cygnus X-1. III. Radio-X-ray correlations”, Gleissner, T., Wilms, J., Pooley, G. G., Nowak, M. A., Pottschmidt, K., Markoff, S., **Heinz, S.**, Klein-Wolt, M., Fender, R. P., Staubert, R., 2004, *Astrophysical Journal*, 606, 185
 65. “Observations of A4059 with Chandra, Hubble Space Telescope, and the Very Large Array: Unraveling a complex cluster/radio galaxy interaction”, Choi, Y.-Y., Reynolds, C.S., **Heinz, S.**, Rosenberg, J.L., Perlman, E.S., Yang, J., 2004, *Astrophysical Journal*, 606, 185
 66. “Ram pressure stripping and the formation of cold fronts”, **Heinz, S.**, Churazov, E., Forman, W., Jones, C., & Briel, U. 2003, *Monthly Notices of the Royal Astronomical Society*, 346, 13
 67. “The non-linear dependence of flux on black hole mass and accretion rate in core-dominated jets”, **Heinz, S.** & Sunyaev, R.A. 2003, *Monthly Notices of the Royal Astronomical Society* 343, L59-L64
 68. “A fundamental plane of black hole activity”, Merloni, A., **Heinz, S.**, & DiMatteo, T. 2003, *Monthly Notices of the Royal Astronomical Society* 345, 1057
 69. “Radio lobe dynamics and the environment of microquasars”, **Heinz, S.** 2002, *Astronomy & Astrophysics* 388, L40-43
 70. “Cosmic rays from microquasars: A new narrow component to the CR spectrum?”, **Heinz, S.** & Sunyaev, R.A. 2002, *Astronomy & Astrophysics* 390, 751-766

71. “*Chandra* ACIS-S observations of Abell 4059: Signs of dramatic interaction between a radio galaxy and a galaxy cluster”, **Heinz, S.**, Choi, Y.-Y., Reynolds, C.S., & Begelman, M.C. 2002, *Astrophysical Journal Letters* 569, 79-82
72. “Hiding in plain sight: Chandra observations of the quiescent neutron star 4U 2129+47 in eclipse”, Nowak, M., **Heinz, S.**, & Begelman, M.C. 2002, *Astrophysical Journal* 573, 778-788
73. “Radio and X-ray detectability of buoyant radio plasma bubbles in clusters of galaxies”, Ensslin, T. & **Heinz, S.** 2002, *Astronomy & Astrophysics* 384, L27-31
74. “The hydrodynamics of dead radio galaxies”, Reynolds, C.S., **Heinz, S.**, & Begelman, M.C. 2002, *Monthly Notices of the Royal Astronomical Society* 332, 271-282
75. “The flared disk project - simultaneous *RXTE/ASCA* observations of X1822-371”, **Heinz, S.** & Nowak, M.A. 2001, *Monthly Notices of the Royal Astronomical Society*, 320, 249-260
76. “Shocks and sonic booms in the intracluster medium: X-ray shells and radio galaxy activity”, Reynolds, C.S., **Heinz, S.**, & Begelman, M.C. 2001, *Monthly Notices of the Royal Astronomical Society*, 549, L179-183
77. “Jet acceleration by tangled magnetic fields”, **Heinz, S.** & Begelman, M.C. 2000, *Astrophysical Journal*, 535, 104-117
78. “A shotgun model for gamma ray bursts”, **Heinz, S.** & Begelman, M.C. 1999, *Astrophysical Journal Letters*, 527, L35-38
79. “A Rossi X-Ray Timing Explorer study of M87 and the core of the virgo cluster”, Reynolds, C.S., **Heinz, S.**, Fabian, A.C., & Begelman, M.C. 1999, *Astrophysical Journal* 521, 99-102
80. “X-ray signatures from evolving radio galaxies”, **Heinz, S.**, Reynolds, C.S. & Begelman, M.C. 1998, *Astrophysical Journal*, 501, 126-136
81. “Analysis of the synchrotron emission from the M87 Jet”, **Heinz, S.** & Begelman, M.C. 1997, *Astrophysical Journal*, 490, 653-663

Conference Proceedings Articles

82. “Exploring Regimes in Black Hole Scaling”, Heinz, S. & Merloni, A., 2012, in *Proceedings of the 29th Symposium of the International Astronomical Union*, eds.: Zhang, Belloni, Mendez, & Zhang
83. “3C28 in Abell 115 - A Radio Source With a Twist”, Forman, W., Churazov, E., Giacintucci, S., Machacek, M., Kraft, R., Jones, C., **Heinz, S.**, Markevitch, M., Viklinin, A., Murgia, M., Randall, S., & Johnson, R., 2010, in *X-Ray Astronomy 2009: Present Status, Multi-Wavelength Approach, and Future Perspectives*

-
84. “The Dynamical Intracluster Medium: A Combined Approach of Observations and Simulations”, Roediger, E., Brueggen, M., Simionescu, A., Boehringer, H., **Heinz, S.**, 2009, in Proceedings of *The Monster’s Fiery Breath: Feedback in Galaxies, Groups, and Clusters*, eds.: **S. Heinz** & E. Wilcots
 85. “Simulations of Cluster Heating by AGN Outflows”, Morsony, B., **Heinz, S.**, Ruszkowski, M., & Brueggen, M., 2009, in Proceedings of *The Monster’s Fiery Breath: Feedback in Galaxies, Groups, and Clusters*, eds.: **S. Heinz** & E. Wilcots
 86. “Evolution of X-ray Cavities”, Roediger, E., Brueggen, M., Simionescu, A., Boehringer, H., **Heinz, S.**, 2009, in Proceedings of *The Monster’s Fiery Breath: Feedback in Galaxies, Groups, and Clusters*, eds.: **S. Heinz** & E. Wilcots
 87. “Jets as high energy sources: Clues for particle content and energetics”, Heinz, S., 2008, in Proceedings of Dublin-HEPRO meeting, eds.: F. Aharonian & F. Rieger
 88. “The interaction of microquasar jets with the ISM”, Heinz, S., 2008, in Proceedings of *A population explosion: The Nature and Evolution of X-ray Binaries in Diverse Environments*, eds.: R. Bandyopadhyaya & S. Wachter
 89. “Modeling the Relativistic Jets in SS 433 Using Chandra X-ray Spectroscopy”, Marshall, H., Canizares, C., Heinz, S., Hillwig, T., Mioduszewski, A., & Schulz, N., 2008, in *Relativistic Astrophysics Legacy and Cosmology*, eds.: B. Aschenbach, V. Burwitz, G. Hasinger, & B. Leibundgut
 90. “Jet feedback in clusters: Simulating the interaction of jets with dynamic cluster atmospheres”, **Heinz, S.**, Brueggen, M., Ruszkowski, M., Young, A., & Levesque, E., 2007, in Proceedings of the conference on *Extragalactic Jets: Theory and Observation from Radio to Gamma Rays*, eds. T. Rector
 91. “Cosmological evolution of the AGN Kinetic Luminosity Function”, Merloni, A. & **Heinz, S.**, 2007, in Proceedings of the 238th IAU symposium, *Black holes: from stars to galaxies - across the range of masses*, eds. V. Karas & G. Matt
 92. “The answer is blowing in the wind: The first 3D simulations of jets in realistic galaxy clusters”, **Heinz, S.**, Brueggen, M., Young, A., & Levesque, E., 2007 in Proceedings of *Cooling flows in galaxies and clusters of galaxies*, eds. H. Boehringer
 93. “The interaction of microquasar jets with the ISM”, **Heinz, S.**, 2007, in Proceedings of *VIIth Microquasar Workshop, Microquasars and beyond*, eds. Belloni, T.
 94. “Why the fundamental plane of black hole activity is not a distance driven artifact”, **Heinz, S.**, Merloni, & DiMatteo, T., 2005, in Proceedings of *Triggering Relativistic Jets*, eds. W.H. Lee & E.R. Ruiz
 95. “The jet/ISM interaction in three nearby radio galaxies as seen with Chandra”, Kraft, R., Forman, W.R., Churazov, E., Eilek, J., Hardcastle, M., **Heinz, S.**, Jones, C., Markevitch,

- M., Murray, S., Nulsen, P., Owen, F., Vikhlinin, A., & Worrall, D., 2005, in *Proceedings of X-Ray and Radio Connections*, eds. L.O. Sjouwerman and K.K Dyer
96. “Scale invariant jets: from binaries to AGNs”, **Heinz, S.**, Sunyaev, R., Merloni, A., & DiMatteo, T., 2004, in *Proceedings of Accretion on all mass scales*, eds. Maccarone, T., & Fender, R.P.
 97. “A fundamental plane of black hole activity: Pushing forward the unification scheme”, Merloni, A., **Heinz, S.**, DiMatteo, T., 2004, in *Proceedings of Accretion on all mass scales*, eds. Maccarone, T., & Fender, R.P.
 98. “Outbursts from supermassive black holes and their impacts on the hot gas in elliptical galaxies”, Forman, W., Jones, C., Churazov, E., **Heinz, S.**, Kraft, R., Markevitch, M., Nulsen, P., Vikhlinin, A., 2004, in *Proceedings of Growing black holes: Accretion in the cosmological context*, eds. Merloni, A., Nayakshin, S., Sunyaev, R.
 99. “The importance of outflows for black hole growth”, **Heinz, S.**, Sunyaev, R., Merloni, A., & DiMatteo, T., 2004, in *Proceedings of Growing black holes: Accretion in the cosmological context*, eds. Merloni, A., Nayakshin, S., Sunyaev, R.
 100. “The interaction of radio galaxies with the intracluster medium”, **Heinz, S.** & Ensslin, T., 2003, in *Proceedings of The Riddle of Cooling Flows in Galaxies and Clusters of Galaxies*, eds. Reiprich, T. H., Kempner, J. C., and Soker, N.
 101. “The interaction of relativistic jets with their environment”, **Heinz, S.**, 2003, *NewAR* 47, 565-567
 102. “Cosmic rays from microquasars”, **Heinz, S.** & Sunyaev, R.A. 2002, in *Proceedings of the 4th Microquasar Workshop*, eds. Ph. Durouchoux, Y. Fuchs, & J. Rodriguez (Kolkata: Center for Space Physics), 132-134
 103. “Simple scaling and the non-linear mass-luminosity relation in radio sources”, **Heinz, S.** & Sunyaev, R. A. 2002, in *Lighthouses of the Universe: The Most Luminous Celestial Objects and Their Use for Cosmology*, eds. M. Gilfanov, R. Sunyaev, E. Churazov (Berlin: Springer), 453-455
 104. “The synchrotron emission from the M87 jet”, **Heinz, S.** & Begelman, M.C. 1999, in *The Radio Galaxy M87*, eds. J. Röser & K. Meisenheimer, (Berlin, New York: Springer, Lecture Notes in Physics, 530), 229-234

Books, Book Chapters, Notable Non-Refereed Publications

105. “2019 NASA Astrophysics Senior Review, Chandra X-ray Observatory”, Sanders, W., Fujieh, M., Bregman, J., Haggard, D., Hartigan, P., **Heinz, S.**, Kaaret, P., Safi-Harb, S., 2019, NASA
106. “Astromineralogy of Interstellar Dust with X-ray Spectroscopy”, Corrales, L., Valencic, L., Costantini, E., Garcia, J., Gatuzz, E., Kallman, T., Lee, J., Schulz, N., Zeegers, S.,

- Canizares, C., Draine, B., Heinz, S., Hodges-Kluck, E., Paerels, F., Smith, R., Temim, T., Wilms, J., The Astronomy and Astrophysics Decadal Survey 2020, Science White Papers 51c, 264C
107. “*Probing the Structure of Interstellar Dust from Micron to Kpc Scales with X-ray Imaging*”, Valencic, L.; Corrales, L.; **Heinz, S.**; Smith, R.; Clayton, G.C.; Costantini, E.; Draine, B.; Lee, J.; Paerels, F.; Temim, T.; Wilms, J., The Astronomy and Astrophysics Decadal Survey 2020, Science White Papers 51c, 24V
108. “*Compact Stellar Jets*”, Maccarone, T. J.; Gallo, E.; **Heinz, S.**; Miller-Jones, J.C. A.; Casella, P.; Eikenberry, S.; Gandhi, P.; Plotkin, R.M.; Sivakoff, G.R.; Steiner, J.F.; Tetarenko, A.J.; Tomsick, J.A., Astro2020 Science White Paper 186
109. “*2016 NASA Astrophysics Senior Review, Chandra X-ray Observatory*”, Kniffen, D., Ferrarese, L., Heinz, S., Holmes, C., Kouveliotou, C., Marcum, P., Strolger, L., 2016, NASA
110. “*X-ray Dust Tomography: the New Frontier in Galactic Exploration*”, **Heinz, S.**, Corrales, L., 2016, Chandra Newsletter, Issue 23, 1
111. “*A Faint X-ray Dust Scattering Echo from V404 Cyg in Response to Recent Flares*”, **Heinz, S.**, Beardmore, A., Jonker, P., Kuulkers, E., Page, K.L., Motta, S., Corrales, L., Brandt, W.N., 2016, The Astronomer’s Telegram, 8507
112. “*Rapid Bright X-ray Flares from V404 Cyg During December-2015 Outburst*”, **Heinz, S.**, Jonker, P., Corrales, L., Brandt, W.N., 2015, The Astronomer’s Telegram, 8489
113. “*The X-ray Surveyor Mission: A Concept Study*”, Gaskin, J.A., Weisskopf, M.C., Viklinin, A., Tanabbaum, H.D., Bandler, S.R., Bautz, M.W., Burrows, D.N., Falcone, A.D., Harrison, F.A., Heilmann, R.K., **Heinz, S.**, Hopkins, R., Kilbourne, C.A., Kouveliotou, C., Kraft, R.P., Kravtsov, A.V., McEntaffer, R.L., Natarajan, P., O’Dell, S.L., Petre, R., Prieskorn, Z.R., Ptak, A.F., Ramsey, B.D., Reid, P.B., Schnell, A.R., Schwartz, D.A., Townsley, L.K., 2016, Proceedings of the SPIE, 9601, id. 96010J 14 pp
114. “*2014 NASA Astrophysics Senior Review*”, Oppenheimer, B., Bregman, J., Guinan, E., Harwitt, M., **Heinz, S.**, Johnston, K., Kieda, D., Miller, H.R., Rothschild, R., Sanders, D., 2014, NASA
115. “*Jet-Environment Interactions as Diagnostics of Jet Physics*”, **Heinz, S.**, 2013, book chapter in *The Physics of Accretion onto Black Holes*, ed. M. Falanga, Space Science Reviews (Berlin, New York: Springer)
116. “*AGN Evolution*”, Merloni, A. & Heinz, S., 2012, book chapter in *Planets, Stars, and Stellar Systems*, ed. W. Keel, (Berlin, New York: Springer)
117. “*The Hot and Energetic Universe: AGN feedback in galaxy clusters and groups*”, Croston, J. H., Sanders, J. S., Heinz, S., Hardcastle, M. J., Zhuravleva, I., Bîrzan, L.,

- Bower, R. G., Brüggén, M., Churazov, E., Edge, A. C., Etori, S., Fabian, A. C., Finoguenov, A., Kaastra, J., Gaspari, M., Gitti, M., Nulsen, P. E. J., McNamara, B. R., Pointecouteau, E., Ponman, T. J., Pratt, G. W., Rafferty, D. A., Reiprich, T. H., Sijacki, D., Worrall, D. M., Kraft, R. P., McCarthy, I., Wise, M., 2013, in “Supporting paper for the science theme The Hot and Energetic Universe to be implemented by the Athena+ X-ray observatory”
118. “*The Monster’s Fiery Breath: Feedback in Galaxies, Groups, and Clusters*”, 2009, book, Editors: S. Heinz, E. Wilcots, AIP, New York
119. “*High Energy Processes in Stellar Remnants*”, Kaaret, P., Butt, Y., Digel, S., Funk, S., Halzen, F., Hanna, D., Heinz, S., Gyuk, G., Hays, E., LeBohec, S., Meszaros, P., Moskalenko, I., Mukherjee, R., Ong, R., Pohl, M., Romani, R., Sinnis, G., Slane, P., Wakely, in “Astro2010: The Astronomy and Astrophysics Decadal Survey, Science White Papers, no. 145”, 2009, The National Academy of Sciences
120. “*Cosmic Feedback from Supermassive Black Holes*”, Fabian, Andrew C., Churazov, E., Donahue, M., Forman, W.R., Garcia, M.R., Heinz, S., McNamara, B.R., Nandra, K., Nulsen, P., Ogle, P., Perlman, E.S., Proga, D., Rees, M.J., Sarazin, C.L., Sunyaev, R.A., Taylor, G.B., White, S.D.M., Vikhlinin, A., Worrall, D.M., in “Astro2010: The Astronomy and Astrophysics Decadal Survey, Science White Papers, no. 73”, 2009, The National Academy of Sciences
121. “*Galaxy Clusters Across Cosmic Time*”, Arnaud, M., Bohringer, H., Jones, C., McNamara, B., Ohashi, T., Patnaude, D., Arnaud, K., Bautz, M., Blanchard, A., Bregman, J., Chartas, G., Croston, J., David, L., Donahue, M., Fabian, A., Finoguenov, A., Furuzawa, A., Gallagher, S., Haba, Y., Hornschemeier, A., Heinz, S., Kaastra, J., Kapferer, W., Lamer, G., Mahdavi, A., Makishima, K., Matsushita, K., Nakazawa, K., Nulsen, P., Ogle, P., Perlman, E., Ponman, T., Proga, D., Pratt, G., Randall, S., Richards, G., Romer, K., Ruszkowski, M., Schmidt, R., Smith, R., Tananbaum, H., Vrtilik, J., Worrall, D., in “Astro2010: The Astronomy and Astrophysics Decadal Survey, Science White Papers, no. 4”, 2009, The National Academy of Sciences
122. “*Galactic Compact Objects Section of the White Paper on the Status and Future of Ground-based TeV Gamma-ray Astronomy*”, Kaaret, P., Abdo, A. A., Arons, J., Baring, M., Cui, W., Dingus, B., Finley, J., Funk, S., Heinz, S., Gaensler, B., Harding, A., Hays, E., Holder, J., Kieda, D., Konopelko, A., LeBohec, S., Levinson, A., Moskalenko, I., Mukherjee, R., Ong, R., Pohl, M., Ragan, K., Slane, P., Smith, A., Torres, D., APS report on the the status and future of TeV gamma-ray astronomy, 2009
123. “*Report by the Committee on the Future of U.S. Radio Astronomy*”, McCray, R., Backer, D., Carilli, C., Gaensler, B., Genzel, R., Gnedin, N., Haynes, M., Heinz, S., Hewitt, J., Lazio, J., Readhead, A., Sargent, A., Wilcots, E., Wong, R., a report sponsored by the Associates Universities, 2009

-
124. “*EVLA radio detections of MAXI J1836-194 suggest it is a black hole X-ray binary*”, Miller-Jones, J., Sivakoff, G., Rupen, M., and the JACPOT XRB collaboration, The Astronomer’s Telegram, 2011, telegram 3628
 125. “*Radio Activity in H1743-322*”, Miller-Jones, J., Sivakoff, G., and the JACPOT XRB collaboration, The Astronomer’s Telegram, 2009, telegram 2062