

Craig O. Heinke

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Research Interests

Understanding neutron stars, black holes, white dwarfs, and how they accrete matter in binary systems; the interior physics of neutron stars; and how stars interact in dense clusters, through observations at multiple wavelengths (X-ray, optical, ultraviolet, infrared, and radio).

Education

Ph.D. Astronomy, Harvard University, Cambridge, MA, June 2004, advisor J. E. Grindlay
M.A. Astronomy, Harvard University, Cambridge, MA, June 2002
B.A. Physics, Carleton College, Northfield, MN, June 1997, *Magna Cum Laude*

Positions

Assistant/Associate Professor Dept. of Physics, U. of Alberta	July 2008-2012/ July 2012– Edmonton, AB, Canada
Research Associate Supervisor C. L. Sarazin, U. of Virginia	Aug. 2007–June 2008 Charlottesville, VA, USA
Lindheimer Postdoctoral Fellow Dept. of Physics & Astronomy, Northwestern U.	Sept. 2004–Aug. 2007 Evanston, IL, USA

Honors

NSERC Discovery Accelerator Supplement Award, 2016
Faculty of Science Research Award, University of Alberta, 2015
Alexander von Humboldt Fellow, Bonn, Germany, 2015
Martha Cook Piper Research Prize, University of Alberta, 2012
Avenue Edmonton “Top 40 Under 40”, 2012
Ingenuity New Faculty, Alberta Innovates, 2010-2013
Lindheimer Postdoctoral Fellowship, Northwestern University, 2004-2007
Certificate of Distinction in Teaching (Graduate School of Arts and Sciences, Harvard Univ.), 2004
Fireman Award for Best Doctoral Dissertation (Astronomy Dept., Harvard Univ.), 2004

Supervision

Postdocs **J. Gladstone**, (A. Bhatia Fellow) 2009–2014; **N. Leigh** (NSERC Fellow), 2013–2014; **Chengkui Li**, (Institute for High Energy Physics [Beijing] International Fellow) 2015–2016; **A. Shaw**, 2016–now.

PhD students **K. Elshamouty** 2012–2016, **A. Bahramian** 2012–2016.

Master’s students **M. Chowdhury**, 2009–2011; **K. Elshamouty** 2010–2012; **A. Bahramian** 2011–2012; **R. Gazer** 2015–now; **A. Hattawi** 2016–now; **Y. Zhao** 2016–now.

Co-supervised Ph.D. student **P. Maksym** (at Northwestern U., 2006–2007)

Undergraduate research: 18 students during 12 semesters, 16 students over 6 summers.

27 papers published involving graduate & undergraduate students, 7 grad student first-author, 9 undergrad student first-author.

Four NSERC USRA summer students (**Coomber, Engel, Catuneanu & Forestell**) have subsequently won NSERC MSc-level scholarships; **Engel** has also won a Rhodes Scholarship, a Sir James Loughheed Award, and an Alberta Science & Technology Leadership (ASTech) Award. **Bahramian** has won the Andrew Stewart Memorial Graduate Prize, a CASCA Best Student Poster Award, and a Graduate Student Teaching Award; **Gazer** won 2nd Prize Talk at the U. of A. Grad Physics Research Symposium.

External Awards of Research Funding, Observing Time as Principal Investigator

2016: NSERC Discovery Accelerator Supplement, \$120,000 over 3 years.

2014: Alexander von Humboldt Fellow, €22,916 for a 6-month fellowship.

2010: Alberta Ingenuity New Faculty Award, \$279,000 over 3 years.

2008, 2011, 2016: NSERC Discovery Grants, \$27,486/year (2008-2010), \$28,000/year (2011-2015), \$69,000/year (2016-2020).

PI on approved telescope proposals: 9 *Chandra* X-ray (82 hours total, & analysis funds), 2 Hubble (13.5 hours total, & funds), 7 XMM X-ray (107 hours total, & funds), 10 Gemini optical/IR (55 hours total), 2 VLA radio (12 hours total), 1 VLBA radio (45 hours), 38 Swift X-ray (16 hours), 1 NuSTAR X-ray (28 hours), 1 AstroSAT (11 hours). PhD student **Bahramian** PI of XMM, Swift, & Gemini proposals.

Co-I on many successful telescope proposals, acquiring >800 hours of *Chandra* time under 8 different PIs, on 8 proposals acquiring >130 hours of Hubble imaging, and on many successful proposals for RXTE, Swift, Suzaku and XMM (X-ray), Gemini, TNG (optical and near-infrared), Herschel (far infrared) and ATCA and the VLA (radio).

Scientific Service

Chair of Gemini Users' Committee, 2014-2015; member representing Canada 2012-2015.

SuperChair (2012-2013) of CanTAC (which allocates time on overseas Canadian telescopes); Galactic Panel Chair 2012, member 2011-2013. Member of Time Allocation Committees for Rossi X-ray Timing Explorer (3 years), *Chandra* X-ray Observatory (3 yr), National Radio Astronomy Observatory (2 yr), XMM-Newton (1 yr). External referee for NSERC, Gemini, CFHT, NASA, NSF.

Chair of CASCA Ground-Based Astronomy Committee (2016-), member of CASCA's Long-Range Plan Implementation Committee (2016-) and Canadian Gemini Science Committee (2015-).

Member of NSERC Scholarships & Fellowships Committee (2014-2017).

Chair of Local Organizing Committee for *CASCA 2017* (Edmonton, Canada). Member of Scientific Organizing Committee for *CASCA 2017*; *Compact Binaries in Globular Clusters*, Leiden, Netherlands, 2012; *Physics of Neutron Stars 2014* and *Physics of Neutron Stars 2017*, St. Petersburg, Russia; *The Physics of Neutron Stars, and All That Jazz*, Montreal, Canada, 2015; COSPAR session E1, Istanbul, Turkey, 2016 (cancelled).

Co-organizer of *MODEST-6, Modeling Dense Stellar Systems* conference (Northwestern U., 2005).

Referee for dozens of papers for Nature, Astrophysical Journal (including Supplement & Letters), Astronomical Journal, Astronomy & Astrophysics, and Monthly Notices of the Royal Astronomical Society, averaging 7-10 papers/year.

University Service

Associate Chair for Research, Physics Department, 2015-2018.
Focus Area Coordinator for Astrophysics on Physics Strategic Planning Committee, 2012–.
Member of 5 Physics Dept. new faculty hiring committees in 2007-08, 2009-10, 2012, 2012-13, 2014.
Colloquium organizer for U. Alberta Physics Dept., 2009-2011.
Member of Harvard University Astronomy Department Curriculum Review Committee, 2004

Invited Colloquium/Seminar Talks, 2011–present

McGill Space Institute Astronomy Seminar, Feb. 2017
Michigan State University Astro seminar, Jan. 2017
Univ. of Southampton AstroGrav Seminar, Southampton, UK, June 2015
Univ. of Exeter Astrophysics Seminar, Exeter, UK, May 2015
Univ. of Birmingham Astrophysics Seminar, Birmingham, UK, May 2015
ASTRON Colloquium, Dwingeloo, Netherlands, May 2015
Anton Pannekoek Institute Astrophysics Colloquium, Amsterdam, Netherlands, May 2015
University Wroclaw Nuclear Physics Institute Seminar, Wroclaw, Poland, April 2015
Tuebingen University Astrophysics Seminar, Tuebingen, Germany, April 2015
Radboud University Astrophysics Colloquium, Nijmegen, Netherlands, March 2015
Leiden University Astrophysics Colloquium, Leiden, Netherlands, March 2015
Max Planck Institut für Astrophysics, Seminar, Garching Germany, March 2015
Max Planck Institut für Extraterrestrische Physik, Seminar, Garching Germany, March 2015
Max Planck Institut für Radioastronomie, Colloquium, Bonn Germany, February 2015
Max Planck Institut für Radioastronomie, Seminar, Bonn Germany; February 2015
U. Alberta Physics Colloquium, Edmonton AB, March 2014
Harvard Astrophysics Colloquium, Cambridge MA, May 2012
U. Wisconsin-Milwaukee Physics Colloquium, Milwaukee WI, March 2012
Northwestern U. Astrophysics Seminar, Evanston IL, March 2012
U. Alberta Physics Colloquium, Edmonton AB, Sept. 2011
Texas A&M University Astrophysics Seminar, College Station TX, Feb. 2011
UBC Astronomy Colloquium, Vancouver BC, Feb. 2011

Invited Conference Talks, 2011–present

New Compstar annual meeting, Warsaw, Poland, March 2017
Neutron Stars: A Cosmic Laboratory, Bad Honnef, Germany, Oct. 2016
COSPAR 2016, Istanbul, Turkey, Aug. 2016 (cancelled due to a coup)
EWASS 2016, Athens, Greece, July 2016 (declined)
Neutron Stars in the Multi-Messenger Era, Athens, Ohio, US, May 2016
The Many Faces of Neutron Stars, Munich, Germany, Sept. 2015
The Zoo of Accreting Compact Objects, Leiden, Netherlands, Aug. 2015
The Neutron Star Radius and All That Jazz, June 2015
Science & Future of Gemini, Toronto, Canada, June 2015
ISSI Workshop on Transitional Millisecond Pulsars, Bern, Switzerland, March 2015

CASCA 2014, Quebec City, Canada, June 2014
Neutron Star Signals and Structure, Florence, Italy, March 2014
X-ray Binaries 13, Bormio, Italy, Jan. 2013
Compact Binaries in Globular Clusters, Leiden, Netherlands, Sept. 2012
Extreme Quantum Chromodynamics, Georgetown U., Washington DC, Aug. 2012
Astrophysical Transients, Institute for Nuclear Theory, Seattle WA, July 2011
Physics of Neutron Stars, Ioffe Institute, St. Petersburg, Russia, July 2011
Canadian Astronomical Society (CASCA) 2011, London ON, May 2011
Canadian Institute for Advanced Research (Cosmology & Gravity), Whistler BC, Apr. 2011

Outreach Leadership

Arranged creation of scale model of solar system for west atrium of U. Alberta CCIS (science) building (<http://www.ualberta.ca/~stars/planets.html>), 2009-2011.
Co-investigator on U. of Alberta TLEF project “Enhancing Astronomy Education through On-Campus Telescopes”, \$55,507 over two years (2011-2013).
Co-coordinator of Physics Open Houses at Northwestern U. (outreach for area junior high students), spring 2005, 2006; PI of successful 2006 grant proposal for \$2000.

Public Talks, 2011–present

Royal Astronomical Society of Canada, Edmonton Centre, May 2016
U. of Alberta Observatory, Oct. 2015
U. of Alberta Observatory, Oct. 10, 2014
Hands-on Physics (high schoolers), Aug. 6, 2014
Austin O’Brien High School, Edmonton, Nov. 12, 2013
U. of Alberta Alumni Weekend, Sept. 28, 2013
W. P. Wagner High School, Edmonton, Dec. 14, 2012
Royal Astronomical Society of Canada, Edmonton Centre, Dec. 10, 2012
Northern Alberta Physics Teachers Meeting, Edmonton, Dec. 7, 2012
U. Alberta Alumni Weekend, Edmonton, Sept. 22, 2012
ELLA (Edmonton Lifelong Learners Association), May 2011.
E.W. Stokes Primary School, Washington DC, May 2011.

Media Interviews

Interview for CBC Radio One program “Silver and Exact” on mirrors, Dec. 2011.
Gave interviews for several print, electronic, and radio (CBC Quirks & Quarks, CBC Edmonton Radio Active) news sources relating to discovery of superfluidity in neutron star cores, Feb. 2011.
Gave 11 interviews for radio (CBC Quirks & Quarks), TV (City TV Edmonton, French CBC Edmonton), web-based (e.g. Space.com) and print (Edm. Journal, Edm. Sun-Times, Canadian Press, Physics World, Sky & Telescope) media relating to Nature paper, Nov. 2009.