Date of Revision: August 2023

Jason J.B. Harlow CURRICULUM VITAE

A. BIOGRAPHICAL INFORMATION

PERSONAL

- **Name:** Jason John Bradley Harlow
- **University Address:** Department of Physics, 60 St. George St. Suite 129E, Toronto ON, M5S1A7
- **Office Phone:** 1-416-978-5493

DEGREES

- **Ph.D. 2000**

  Department of Astronomy and Astrophysics, The Pennsylvania State University
  Thesis Title: "The Faint End of the Stellar Luminosity Function"
  Supervisor's name: Donald Schneider

- **B.Sc. 1993**

  Department of Physics, University of Toronto
  Thesis Title: "Radial Velocities of M Dwarfs"
  Supervisor's name: Karl Kamper

HONOURS

- Canadian Association of Physicists Excellence in Teaching Undergraduate Physics (2023)
- Outstanding Teaching Award, Faculty of Arts & Science, University of Toronto (2022)
- The Royal Astronomical Society Gold Medal, University of Toronto (1993)

EMPLOYMENT

- **Department of Physics, University of Toronto**

  Professor, Teaching Stream, 2022 - present
  Associate Professor, Teaching Stream, 2016 - 2022
  Associate Chair, Undergraduate Studies, 2016 - 2019
  Senior Lecturer, 2010 - 2015
  Lecturer, 2005 - 2010
  Sessional Instructor, 2004

- **Department of Physics, University of the Pacific**

  Assistant Professor, 1999 - 2004

- **Department of Astronomy and Astrophysics, The Pennsylvania State University**
  Graduate Research and Teaching Assistant, 1994 - 2000
- **David Dunlap Observatory, University of Toronto**
  Telescope Operator, 1993 - 1994
- **Department of Astronomy and Astrophysics, University of Toronto**
  Undergraduate Research Assistant, 1992 - 1993

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- American Association of Physics Teachers (2005 - present)
- Ontario Association of Physics Teachers (2005 - present)
- Canadian Association of Physicists (2016 - present)

B. ACADEMIC HISTORY

RESEARCH ENDEAVOURS

- Physics Education Research, Best Teaching Methods
- Low Mass Stars, the Faint End of the Stellar Luminosity Function
- Astronomical Instrumentation, Fibre Optics

RESEARCH AWARDS

- NSERC PromoScience for Let's Talk Science, 2021-23, total $49,800
- University of Toronto Faculty of Arts and Science Advanced Teaching and Learning in Arts & Science (ATLAS) June 2018, for 1 year, total $5,749.74
- University of Toronto Stepping UP Student Experience Fund (SEF), Apr. 2007, for 2 years, total $1,160,000, co-investigator with Michael Luke, David Bailey and David Harrison
- University of Toronto Instructional Technology Courseware Development Fund (ITCDF) Apr. 2007, 4 months, total $11,700, co-investigator with Michael Luke, David Bailey and David Harrison
- University of Toronto Stepping UP Student Experience Fund (SEF) Jan. 2008 for 6 months, $90,200, co-investigator with Michael Luke, David Bailey and David Harrison

C. SCHOLARLY, CREATIVE AND PROFESSIONAL WORK

BOOKS AUTHORED

- *"Physics of Music"*, by Jason Harlow and Mark Kazakevich, textbook work in progress

REFEREED ARTICLES

- Marshall, J., Fenton, L.K. and **Harlow, J.J.B.** "Limitations of applying grain weight similitude in aeolian studies with NASA Mars Wind Tunnel" 2021, *Journal of Aeolian Rese*arch 53, 100732
- **Harlow, J.J.B.**, Harrison, D.M., Justason, A., Meyertholen, A. and Wilson, B. "Personality types and student performance in an introductory physics course" 2017, *Phys. Rev. Phys. Educ. Res.* 13, 020124
- **Harlow, J.J.B.**, Harrison, D.M and Meyertholen, A. "Effective student teams for collaborative learning in an introductory university physics course" 2016, *Phys. Rev. Phys. Educ. Res.* 12, 010138
- French, M., Taverna, F.A., Neumann, M., Paulo Kushnir, L., **Harlow, J.J.B.**, Harrison, D.M. and Serbanescu, R.M. "Textbook Use in the Sciences and Its Relation to Course Performance" 2015, *College Teaching*, v.63, p.171
- **Harlow, J.J.B.**, Harrison, D.M. and Honig, E. "Compressed-format compared to regular-format in a first-year university physics course" 2015, *American Journal of Physics* v.83, p.272
- **Harlow, J.J.B.**, Landau, R. and Bailey, D.C. "The Effects of Physics Breadth Courses on Student Attitudes About Science" 2014, *Physics in Canada / La Physique au Canada Theme: Physics Education* v.70.2, p.69
- **Harlow, J.J.B.**, Harrison, D.M. and Meyertholen, A. "Correlating student interest and high school preparation with learning and performance in an introductory university physics course" 2014, *Physical Review Special Topics Physics Education Research*, v.10, p.010112
- **Jason Harlow**, Lena Kushnir, Charly Bank, Scott Browning, Jim Clarke, David Harrison, Karen Ing, Cecilia Kutas and Ruxandra Serbanescu "What's all the clicking about? A study of Classroom Response System use at the University of Toronto" 2009, *Collected Essays on Learning and Teaching (CELT)*, vol. 2. (10 pages)
- Melody Neumann, Charly Bank, Scott Browning, Jim Clarke, **Jason Harlow**, David Harrison, Karen Ing, Lena Kushnir, Cecilia Kutas, John Pitre, Ruxandra Serbanescu, Marty Wall, and Ron Wilson "Serial Team Teaching and the Evolving Scholarship of Learning: Students' Perspective" 2008, *Collected Essays on Learning and Teaching (CELT)*, vol. 1. (8 pages)
- Wade, R.A., **Harlow, J.J.B.** and Ciardullo, R.B. "Biases in Expansion Distances of Novae Arising from the Prolate Geometry of Nova Shells" 2000, *Publications of the Astronomical Society of the Pacific*, v.112, p.614 (11 pages)
- Orosz, J.A., Wade, R.A., **Harlow, J.J.B.**, Thorstensen, J.R., Taylor, C.J. and Eracleous, M. "The Post-Common Envelope and Pre-cataclysmic Binary PG 1224+309" 1999, *Astronomical Journal*, v.117, p.1598 (11 pages)
- Percy, J.R., **Harlow, J.J.B.**, Hayhoe, K.A.S., Ivans, I.I., Lister, M., Plume, R., Rosebery, T., Thompson, S. and Yeung, D. "Photometric Monitoring of Bright Be Stars. III. 1988-89 and 1992-95" 1997, *Publications of the Astronomical Society of the Pacific*, v.109, p.1215 (6 pages)
- Orosz, J.A., Wade, R.A. and **Harlow, J.J.B.** "Variable Radial Velocities Among Composite-Spectrum Binaries inthe PG Catalog" 1997, *Astronomical Journal*, v.114, p.317 (9 pages)

- **Harlow, J.J.B.** "The M Dwarf Double Lined Spectroscopic Binary Gliese 372" 1996, *Astronomical Journa*l, v.112, p.2222 (5 pages)
- Upgren, A.R., and **Harlow, J.J.B.** "Space Motions of Low-Mass Stars. II. Radial Velocities" 1996, *Publications of the Astronomical Society of the Pacific*, v.108, p.64 (4 pages)

BOOKS EDITED

- *"University Physics 14th Edition"* by Hugh D. Young and Roger A. Freedman, ©2019 Pearson Addison-Wesley. I accuracy-checked the entire book.
- *"Physics for the Life Sciences"* 3rd Edition by Martin Zinke-Allmang, Ken Sills, Reza Nejat and Eduwardo Galiano-Riveros ©2016 by Nelson. I reviewed five chapters.
- *"Principles & Practice of Physics"* by Eric Mazur ©2014 by Addison-Wesley. I edited the online homework assignments in MasteringPhysics
- *"Physics for Scientists and Engineers: 3rd Edition"* by Randall D. Knight, ©2012 Addison Wesley. I reviewed 10 chapters.
- Ontario High School Textbook: *"Physics 11"* by Maurice DiGiuseppe et al, ©2011 Nelson Education Ltd. I was an accuracy-checker.
- *"University Physics 13th Edition"* by Hugh D. Young and Roger A. Freedman, ©2011 Pearson Addison-Wesley. I accuracy-checked the entire book.
- Ontario Grade 11 Physics Curriculum *"Unit A: Kinematics"* and *"Unit B: Forces"* ©2010 Pearson Edvantage Press. Reviewed and accuracy-checked the new edition.
- *"College Physics: A Strategic Approach 2nd Edition"* by Randall D. Knight, Brian Jones and Stuart Field, ©2010 Pearson Addison-Wesley. Reviewed 8 chapters and accuracy-checked the entire book.
- *"Physics for Scientists and Engineers: A Strategic Approach 2nd Edition"* by Randall D. Knight, ©2007 Addison Wesley. I created a complete set of lecture outlines in Powerpoint, and reviewed and edited the online MasteringPhysics tutorials.
- *"Physics for Scientists and Engineers 6th Edition"* by Paul A. Tipler, Gene Mosca, ©2007 W. H. Freeman. Reviewed and corrected a complete set of Clicker Questions.

NON-REFEREED PUBLICATIONS

- Bailey, D.C., **Harlow, J.J.B.** and Krasnopolskaia, N.N. "The Advanced Physics Lab at the University of Toronto" 2009, Topical Conference on Advanced Laboratories, Session II S14, July 23-25, 2009 University of Michigan www.advlabs.aapt.org
- Bailey, D.C., **Harlow, J.J.B.,** Krasnopolskaia, N.N. and Morris, S.W. "A Knots Experiment" 2009, Topical Conference on Advanced Laboratories, Session IX L02, July 23-25, 2009 University of Michigan www.advlabs.aapt.org
- Sperauskas, J., Boyle, R.P., **Harlow, J.J.B.**, Jahreiss, H. and Upgren, A.R. "An Ongoing Program of Radial Velocities of Nearby Stars" 2004, Bulletin of the American Astronomical Society, 203, 43.02

- **Harlow, J.J.B.** "The Faint End of the Stellar Luminosity Function" 2000, Bulletin of the American Astronomical Society, 197, 127.03
- **Harlow, J.J.B.**, Wade, R.A. and Ciardullo, R.B. "Implications of the Assumption of Spherical Symmetry on Nova Expansion Parallaxes" 1999, Bulletin of the American Astronomical Society, 195, 36.03
- **Harlow, J.J.B.**, Pavlov, G.G. and Halpern, J.P. "HST/NICMOS observations of PSR 0656+14 and Geminga" 1999, Bulletin of the American Astronomical Society, 193, 41.07
- **Harlow, J.J.B.**, Schneider, D.P. "Limits on the Stellar Luminosity Function as Determined from a CCD Transit Survey" 1998 Bulletin of the American Astronomical Society, 191, 108.04
- **Harlow, J.J.B.**, Ramsey, L. W., Andersen, D.R., Fleig, J.D., Rhoads, B.T. and Engel, L.G. "The Upgraded Fiber Optic Echelle Spectrograph" 1997 Bulletin of the American Astronomical Society, 189, 42.07
- **Harlow, J.J.B.** "The Radial Velocity Curves of the Two Components of the Spectroscopic Binary Gliese 372, a Double M-Dwarf System" 1996 Bulletin of the American Astronomical Society, 188, 60.06

CONFERENCE & SYMPOSIA PRESENTATIONS

- **Jason Harlow**, "Gender and Early Success as Predictors of Student Retention in Physics", American Association of Physics Teachers Winter Meeting, New Orleans, Jan.7, 2024, Session SUN-AD-02
- **Jason Harlow**, "Teaching Physics Before and After 2020", Plenary Session, Canadian Association of Physicists Congress (CAP), Queen's University, Fredericton NB, June 21, 2023
- **Jason Harlow**, "Assigning and Facilitating Roles in Physics Lab Group Work" 2013, Ontario Association of Physics Teachers Conference Waterloo May 4-6 2023, Session A.2
- Carolyn Sealfon and **Jason Harlow**, "Classifying Students' Free Responses in Large Classes", Physics Education Research Conference 2018, organized by the American Association of Physics Teachers, Washington DC, Aug.1-2, 2018, Poster Session II-B79
- **Jason Harlow**, "Personality Types and Student Performance in an Introductory Physics Course", International Conference on Improving University Teaching (IUT), Tel Aviv, Israel, July 19, 2017
- **Jason Harlow**, "Personality Types and Student Performance in an Introductory Physics Course", Canadian Association of Physicists Congress (CAP), Queen's University, Kingston ON, May 30, 2017
- **Jason Harlow**, "Clickers in the classroom: best practices, common pitfalls, and a test of efficacy", Large-Class Science & Math Teaching Symposium, Department of Chemistry, University of Toronto, Feb. 19, 2016
- **Jason Harlow** and Andrew Meyertholen "Fun with Waves and Sound" 2014, Ontario Association of Physics Teachers 36th Annual Conference Toronto May 8-10 2014, Session D.20
- **Jason Harlow** "Grade 10: Optics" 2012, Ontario Association of Physics Teachers 34th Annual Conference Waterloo April 26-28 2012, Session A.05

- **Jason Harlow** "Ray Optics" 2011, Ontario Association of Physics Teachers 33rd Annual Conference Hamilton May 12-14 2011, Session C.11
- **Jason Harlow**, Heather Andres, Alireza Mashayekhi, Eric Lee and Kemp Plumb, "Forces, Motion & the Scientific Method" and "Electricity, Magnetism and Geometric Optics" 2010 Ontario Association of Physics Teachers 32nd Annual Conference Toronto April 29-May 1 2010, Sessions B.02, C.07, D.12, E.17, E.20, F.23 and F.26 [I also co-hosted this conference.]
- **Jason Harlow**, David Harrison, Tony Key, "Engaging a Class of a Thousand Students" 2005 Teaching Large Classes: Challenges and Opportunities, Wilfrid Laurier University and Institute for the Advancement of Teaching in Higher Education May 18, 2005.
- Wade, R.A., **Harlow, J.J.B.** and Orosz, J.A. "Variable Radial Velocities Among the Ferguson-Green-Liebert Hot Subdwarf Composites in the PG Catalog" 1996, Third Faint Blue Stars Conference, ed. A.G.D. Philip (Schenectady: Union College), 429

INVITED LECTURES

- "Teaching Large Classes" Mar. 6, 2018, Woodsworth College Teaching in Higher Education seminar
- "Practicals: Not a Lab, Not a Tutorial" Nov. 7, 2012 Department of Astronomy and Astrophysics, University of Toronto
- "Putting Results of Physics Education Research Into Practice" Jan. 4, 2012 Physics Department, Indian Institute of Technology Delhi, India
- "Teaching Big First Year Physics: Combining Labs and Tutorials" Jan. 25, 2011 York University Physics & Astronomy Departmental Colloquium

D. LIST OF COURSES

UNDERGRADUATE COURSES TAUGHT

- **Department of Physics, University of Toronto, 2004-present**
  - **Physics of Music** (PHY207H1): online-only breadth course, with approximately 250 students per semester, 2018-present
  - **Introduction to Physics I** (PHY131H1): first semester of a year-long laboratory-based course suitable for life-sciences students, with approximately 800 students per semester 2009-2015, 2017-2018, 2020-present. In 2023 I was also the Practicals Coordinator.
  - **Emergence in Nature** (PHY196H1): a First-Year Foundation Seminar capped at 30 students, 2021-2022
  - **Foundations of Physics I** (PHY151H1): Practicals Coordinator, our first specialist course with approximately 200 students per semester. 2013-present
  - **Foundations of Physics II** (PHY152H1): Practicals Coordinator, our second specialist course with approximately 270 students per semester. 2014-present

- **Introduction to Physics II** (PHY132H1): second semester of a year-long laboratory-based course suitable for life-sciences students, 500-700 students in the on-semester, 50-100 students in the off-semester. 2009-2015
- **Physics of Everyday Life** (PHY205H1): first taught by me, a one-semester lecture course designed for non-science students, 350 students per semester. 2005-2006, 2012-2014.
- **Introductory Optics** (PHY385H1): first taught by me, a one-semester introduction to the physics of light. Topics covered include: electromagnetic waves and propagation of light; the Huygens and Fermat principles; Geometrical optics and optical instruments; Interference of waves and diffraction; Polarization; Introduction to photons, lasers, and optical fibers. I developed and offered this course for the first time, which has a capacity of 30-50 students per year. 2010-2012
- **Advanced Physics Laboratory** (PHY326, PHY327, PHY426, PHY427, PHY428, PHY429): a laboratory course for 3rd and 4th year Physics and Engineering majors. I supervised students and was involved in design and development of new experiments, and both minor and major revisions of existing experiments. 2004-2007, 2010
- **First Year Physics Practicals:** I coordinated, developed and delivered tutorial and laboratory activities to Introduction to Physics I,/II (PHY131/132), a course with approximately 600 students per semester and 40 teaching assistants. 2008-2010
- **First Year Physics Laboratory:** I developed and coordinated labs for approximately 1300 students, both summer and winter sessions. 2007-2008.
- **Physics for the Life Sciences** (PHY138): a two-semester course with laboratories. I was the second of four lecturers, teaching in Convocation Hall to a class of approximately 1000 students. 2004-2008.

- **Department of Physics, University of the Pacific, Stockton, California, U.S.A., 1999-2004**
  - **General Physics I,II** (PHYS 23,25): a two-semester course with laboratories. I had major responsibility for the design of the course and supervising the labs. 1999-2004
  - **Astronomy** (PHYS 41): a one-semester course with laboratories. I had major responsibility for the design of the course and developing, maintaining and supervising the labs. 2000-2003
  - **Optics** (PHYS 105): a one-semester course with laboratories. I had major responsibility for the design of the course and developing, maintaining and supervising the labs. 2001 -2003
  - **Astrophysics** (PHYS 141): a one-semester course. I completely designed this course in its first and second offering at the University of the Pacific. 2001-2003

GRADUATE COURSES TAUGHT

- **Microteaching Mini-course**, required for all 1st year physics graduate students, to give them practice with formal presentations in front of a small group, and discuss public speaking. 2007-2018, 2023

STUDENT SUPERVISION

- **David Wong, ESC499Y Thesis Course**: I co-supervised this student with David Bailey; I was primary supervisor. Title of Project: "Teaching Methods and Tools for Data Analysis in the Advanced Physics Laboratory". 2005-2006.
- **Jerod Wagman, Summer Research Project**, : I co-supervised this student with David Bailey. "Digitization of High Energy Physics Experiment". 2006
- **Dafna Sussman, ESC499Y Thesis Course**: I co-supervised this student with David Harrison and Lena Paulo-Kushner; I was primary supervisor. Title of Project: "The Effect of Layout Design of Online Documents on Learning". 2006-2007.
- **Andrew Zasowski and Christos Josephides, Course Development Project**: I co-supervised this student with David Harrison. "Development of Materials for Physics Practicals" 2007
- **Eric Nicholson, PHY478H1S Undergraduate Research Project**: "Upgrade to the Ultrafast Fibre Laser: GRENOUILLE". 2011
- **Rikki Landau, M.Sc. Report (Option I)**: I co-supervised this student with David Bailey. The title of her report was: "Student Background, Attitudes, and Performance in Physics Breadth Courses". 2012-2013
- **Jody Chan, Course Development Project**: I co-supervised this student with David Harrison. "Effective Teams in First Year Physics Practicals". 2014
- **Mark Kazakevich, PHY478H1S Undergraduate Research Project**: "Developing Programming Teaching-Tools for in a First-Year Physics Course". 2015
- **Katrina Hooper, Summer Outreach and Course Development Project**: "LN2 Train Demonstration Upgrade". 2017

OTHER TEACHING AND COURSE LECTURES GIVEN

- **Teaching in Higher Education** (THE500): Woodsworth College, University of Toronto. I gave 2-hour guest workshops on "Teaching in Large Classroom Settings" on Mar. 6, 2018 and Mar. 5, 2019

E. ADMINISTRATIVE POSITIONS

POSITIONS HELD AND SERVICE WITHIN THE UNIVERSITY OF TORONTO

- Outreach Committee, Physics Department, Member 2007-2022, Chair 2022-present
- Progress Through the Ranks Committee Member, Physics Department, 2016-2019, 2021-present
- Planning Committee Member, Physics Department, 2016-present
- Let's Talk Science University of Toronto St. George Faculty Advisor, 2016-present
- Academic Board, Governing Council, University of Toronto, Member 2022-present
- Committee on Academic Policy and Programs, Governing Council, University of Toronto, Member 2022-present
- Inclusivity Committee Member, Physics Department, 2015-2021
- **Associate Chair of Undergraduate Studies**, Physics Department, 2016-2019

- Undergraduate Curriculum Committee Chair, Physics Department, 2016-2019
- Sciences Curriculum Committee, Faculty of Arts and Science, 2016-2019
- Outreach Committee Chair, Physics Department 2015-2016
- 299 Research Opportunities Program Review Committee, Faculty of Arts and Science. 2015-2016
- Working Group on Undergraduate Laboratory Renewal (WGUL), Physics Department, 2013-2016
- Physics Web Page Committee 2010-2013
- Physics Library Committee 2010
- Undergraduate Curriculum Committee Member, Physics Department 2005-2010.
- Undergraduate Services Committee, Physics Department 2009-2010
- First Year Practical Development, Physics Department 2005-2008. I worked to redesign the first-year laboratories and tutorials, including renovation of the physical space.
- High School Liaison Committee Chair, Physics Department 2006-2007

POSITIONS HELD AND SERVICE OUTSIDE THE UNIVERSITY OF TORONTO

- **University of the Pacific, Stockton, California, U.S.A., 1999-2004**
  - Committee on Courses and Standards, College of the Pacific (2001-2004)
  - Academic Affairs Committee: Geosciences Program Review Panel (2003-2004)
  - General Education Committee (2003-2004)