

Curriculum Vitae — Patrick Brian Hall

Professor, York University

December 16, 2020

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Degrees

- Ph.D. Astronomy, University of Arizona, Dept. of Astronomy, January 1998
Thesis: *An Optical/Infrared Study of Radio-Loud Quasar Environments*
Advisor: Dr. Richard F. Green
- B.A. Astronomy, University of California at Berkeley, Dept. of Astronomy, May 1990
- B.A. Physics, University of California at Berkeley, Dept. of Physics, May 1990

Employment History

- 07/20-present **Chair and Biophysics Program Coordinator**, Department of Physics and Astronomy, York University
- 07/16-present Professor and Member of the Faculty of Graduate Studies, Department of Physics and Astronomy, York University
- 07/14-06/17, 07/19-06/20 Undergraduate Program Director, Dept. of Physics and Astronomy, York University
- 07/09-06/16 Associate Professor and Member of the Faculty of Graduate Studies, Department of Physics and Astronomy, York University
- 07/04-06/09 Assistant Professor and Member of the Faculty of Graduate Studies, Department of Physics and Astronomy, York University
- 10/03-06/04 Research Associate, Department of Astrophysical Sciences, Princeton University
- 10/00-9/03 Research Associate, Princeton University Observatory, Princeton University; and Investigador Asociado, Depto. de Astronomía, P. Universidad Católica de Chile
- 1/98-9/00 Post-Doctoral Fellow, Department of Astronomy, University of Toronto
- 6/94-12/97 Graduate Research Assistant, Department of Astronomy, University of Arizona
- 9/93-5/94 Graduate Teaching Assistant, Department of Astronomy, University of Arizona
- 9/90-8/93 Graduate Research Assistant, Department of Astronomy, University of Arizona
- 6/89-8/89 Summer Undergraduate Research Assistant, Department of Physics and Astronomy, University of Wyoming

Awards, Academic Honours, and Other Recognition

- York University Faculty of Science & Engineering Established Researcher Award, 2011
- York University Merit Award Recipient (\$2,000 in 2007, 2008, 2009, and 2012)
- Asteroid 153686 Pathall (discovered in 2001) named after me
- National Science Foundation Graduate Fellowship (1991-1993, 1995-1996)
- University of Arizona Graduate Fellowship (1990-1991)
- High Distinction in General Scholarship (summa cum laude) at U.C. Berkeley (1990)
- Regents' and Chancellors' Scholar, University of California, Berkeley (1986-1990)

Scholarly and Professional Activities

- **Principal Investigator, approved Canada-France-Hawaii Telescope proposal *Photometric Monitoring for a Multi-Object AGN Reverberation Mapping Campaign in SDSS-V***
- **Member, York University Department of Physics & Astronomy Adjudicating Committee for the tenure and promotion of Prof. O. Mermut, November 2020 - present**
- **Member, York University Department of Physics & Astronomy Adjudicating Committee for the tenure and promotion of Prof. A. Muzzin, October 2020 - present**
- **Member of the CRESS Executive (Centre for Research in Earth and Space Science), York University, September 2020 - present**
- **Member, York University Faculty of Science Research-Stream Black Faculty Search Committee, August 2020 - present**
- **Co-Investigator, Hubble Space Telescope Cycle 28 approved observing program *Understanding the offset in the broad-line region size-luminosity relation with UV spectroscopy*, May 2020 (PI: Dr. Yue Shen)**
- Trainee, York University Unconscious Bias Affirmative Action Workshop, April 27, 2020
- Member, York University Faculty of Science Major Awards Advisory Committee, April 2020
- Teaching referee for the promotion to Full Professor of Prof. M. Armour, February 2020 - May 2020
- Teaching referee for the tenure and promotion of Prof. A. Muzzin, January 2020 - May 2020
- **Chair, York University Department of Physics & Astronomy File Preparation committee for the tenure and promotion of Prof. A. Muzzin, January 2019 - present**
- Invited Speaker, Astronomy Long Range Plan Town Hall, University of Toronto, Nov. 12, 2019

- Invited Speaker, *The Future of Astronomy Meeting*, University of Waterloo Centre for Astrophysics, Oct. 4, 2019
- Lead Author, Canadian Astronomy Long Range Plan 2020 White Paper, *The Maunakea Spectroscopic Explorer*
- Member, York University Faculty of Science Curriculum committee, Summer 2019 - Summer 2020
- Member, York University Department of Physics & Astronomy Curriculum committee, Summer 2019 - Summer 2020
- Co-Investigator, Hobby-Eberly telescope approved observing program *Checking for deceleration in a quasar outflow*, July 2019
- **Principal Investigator, Gemini approved observing program *Checking for deceleration in a quasar outflow*, June 2019**
- Ad Hoc Program Member, Faculty of Graduate Studies Appeals and Academic Honesty Committee, June 2019
- **York University representative to the Association of Canadian Universities for Research in Astronomy (ACURA) Institutional Council, Jun. 1, 2019 - present**
- Member, York University Division of Natural Science Advisory Committee, April 2019 - June 2020
- **Co-Investigator, NOAO approved observing survey program *DECam Early Imaging of AGN Reverberation Mapping Fields in SDSS-V*, January 2019 (PI: Dr. Yue Shen)**
- **Co-Investigator, Gemini approved observing survey program *Mapping the Accretion Disk and Broad Line Region of the Super-Eddington Active Galactic Nucleus Mrk 142*, December 2018 (PI: Ms. Viraja Khatu)**
- Dean's Representative, York University Physics & Astronomy / Fermilab Joint Research-Stream Faculty Search Committee, December 2018 - May 2019
- Affirmative Action Representative, York University Physics & Astronomy Alternate-Stream Faculty Search Committee, August 2018 - December 2018 (recused due to conflict of interest)
- **Co-Investigator, Hubble Space Telescope Cycle 26 approved observing program *Ultraviolet Echoes of Quasar Accretion Disks*, November 2018 (PI: Ms. Yasaman Homayouni)**
- External Referee, application for promotion for a professor at a Canadian university, Oct. 2018
- Invited Participant, *Wide Field Astronomy in Canada* meeting in Waterloo, ON, Oct. 2018
- **Member, Sloan Digital Sky Survey V (SDSS-V), June 2018 - present; featured in YFile Nov. 4, 2020**
- Accepted talk on 'Canada and the Maunakea Spectroscopic Explorer' at the Canadian Astronomical Society annual meeting, Victoria, BC, May 2018

- **Collaborator, Ultraviolet Near-Infrared Optical Northern Survey (UNIONS), Apr. 2018 - present**, and Canada-France Imaging Survey (CFIS), Feb. 2017 - Apr. 2018. UNIONS is a merger of CFIS and Pan-STARRS.
- Accepted talk on ‘Maunakea Spectroscopic Explorer: Key Science Drivers for a Wide Field Spectroscopic Survey Facility’ at the *SnowPAC Particle Astrophysics And Cosmology* meeting, Snowbird, UT, USA, March 2018
- Accepted talk on ‘The Maunakea Spectroscopic Explorer’ at the *Exploiting Extra-galactic Synergies between WFIRST and Future Facilities* workshop, Pasadena, CA, USA, February 2018
- Accepted talk on ‘MSE: Maunakea Spectroscopic Explorer’ at the *Decadal Survey Planning Community Workshop*, Tucson, AZ, USA, February 2018
- Chair, Maunakea Spectroscopic Explorer Management Group, December 2017 - December 2018
- Co-Investigator, XMM-Newton X-ray satellite approved observing program *Deciphering the Remarkable X-ray Spectrum of the Weak-Line Quasar SDSSJ1521+5202*, November 2017 (PI: Dr. Niel Brandt)
- Accepted talk on ‘MSE: Maunakea Spectroscopic Explorer’ at the *Cosmic Visions: Dark Energy* workshop, Berkeley, CA, November 2017
- Contractor for Essential Analysis and Design Services to Maunakea Spectroscopic Explorer Project Office, August - December 2017
- **Member, Thirty-Meter Telescope International Science Development Team for Time Domain Science, August 2017 - present**
- Volunteer Visitor, National Research Council Herzberg Astronomy & Astrophysics, Victoria, BC, July 2017 - June 2018
- Co-Investigator, Hubble Space Telescope approved observing program *Ultraviolet Echoes of Quasar Accretion Disks*, June 2017 (PI: Dr. Jonathan Trump)
- Accepted talk on “Updates on Emergent and Redshifted BAL Quasars” at the *Active Galactic Nuclei Winds on the Georgia Coast* meeting, Georgia, USA, June 2017
- Invited Participant, *AGN Driven Winds* conference at Technion, Haifa, Israel, May 2017
- Participant, *Disks, Dynamos, and Data: Confronting MHD Accretion Theory with Observations* conference at Kavli Institute for Theoretical Physics, Santa Barbara, California, Feb. 2017
- Principal Investigator, approved Canada-France-Hawaii Telescope proposal *A Transformative Multi-Object AGN Reverberation Mapping Campaign: Continued Photometric Monitoring in 2017A*
- **Maunakea Spectroscopic Explorer Management Group Member, November 2016 - present**
- Collaborator, After SDSS-IV white paper proposal ‘New Dimensions in Black Hole Accretion from Repeat Spectroscopy of Quasars’

- Co-signer, “The Astropy Problem” white paper, (arXiv:1610.03159)
- Invited Participant, *Astronomy 8* conference at the University of Oxford, UK, June 2016
- **Member, Canadian Large Synoptic Survey Telescope Consortium, April 2016 - present**
- Chair, York University Observational Astrophysics Faculty Search Committee, August 2015 - April 2016
- Local Organizing Committee Member, 2016 Great Lakes Quasar Symposium, August 2015 - May 2016
- Speaker, Maunakea Spectroscopic Explorer Collaboration Meeting, Madrid, April 27-29, 2016
- Principal Investigator, approved Canada-France-Hawaii Telescope proposal *A Transformative Multi-Object AGN Reverberation Mapping Campaign: Continued Photometric Monitoring in 2016A*
- Co-signer, After SDSS-IV white paper ‘All-Sky Multi-Epoch Spectroscopy of Quasars’
- Co-Investigator, Chandra X-ray Observatory approved observing programs *Constraining X-ray Absorption in Emergent BAL Quasars* and *Bridging the Gap Between Weak-Line and Typical Quasars*, 2015-2016
- Attended Ontario Association of Physics Teachers 2015 Conference *Bridging the Gap: Strengthening Ties Between K-12 and Postsecondary Educators*, Guelph, ON, May 7-9, 2015
- Attended Physics Teacher Education Coalition Conference *Building a Thriving Undergraduate Physics Program*, Seattle, WA, February 6-8, 2015
- **Maunakea Spectroscopic Explorer Science Team member, August 2014 - present**
- **External Collaborator in the Sloan Digital Sky Survey IV Collaboration for research on Broad Absorption Line Quasars, July 2014 - present**
- Principal Investigator, approved Canada-France-Hawaii Telescope proposal *A Transformative Multi-Object AGN Reverberation Mapping Campaign: Continued Photometric Monitoring in 2015A*
- Local Organizing Committee Member, 2015 Gemini Science Meeting, July 2014 - June 2015
- Co-Investigator, Chandra X-ray Observatory approved observing program *The Nature of Quasars with Redshifted Broad Absorption Lines*, 2014-2015
- Co-Investigator, Chandra X-ray Observatory approved observing program *Shielding Gas Variations in Transforming Broad Absorption Line Quasars*, 2014-2015
- Maunakea Spectroscopic Explorer Advisory Group Member, June 2014 - October 2016
- **External Collaborator in the Sloan Digital Sky Survey IV Collaboration for research on Quasar Reverberation Mapping, Feb. 2014 - present**

- York University representative to the Association of Canadian Universities for Research in Astronomy (ACURA) Institutional Council, Jan. 1, 2014 - Dec. 31, 2016
- Invited Speaker, *The Inner Regions of Quasars* Symposium, University of Texas at Austin, Sept. 12-14, 2014
- Principal Investigator, approved Canada-France-Hawaii Telescope proposal *A Transformative Multi-Object AGN Reverberation Mapping Campaign: Photometric Component*, 81.4 hours in semester 2014A
- Principal Investigator, approved Gemini Observatory observing program *Monitoring Emergent Absorption Troughs in Quasars*, semesters 2013A, 2013B, 2014A, 2014B
- Co-Investigator, Sloan Digital Sky Survey approved extra time program *Multi-Object Reverberation Mapping with SDSS*, semester 2014A
- Undergraduate Program Director, Physics & Astronomy Department, July 1, 2014 - June 30, 2017
- Chair, Physics & Astronomy Department Adjudicating Committee for the promotion of Prof. W. Taylor to Full Professor, December 2013
- Chair, Physics & Astronomy Department ad hoc committee on teaching relief for Prof. A. Kumarakrishnan, November-December 2013
- Subject of York University Press Release *Gas falling into black holes? York U researcher discovers unusual type of quasar*, November 5, 2013, picked up by discovery.com, phys.org, weather.com, etc.
- Faculty of Science Committee on Tenure and Promotions Alternate Member, Fall 2013 - Winter 2016
- Drafted successful course proposal for new course NATS 1585 3.0 'Exploring the Universe', adapted from 2nd semester of NATS 1740 6.0 'Astronomy', Fall 2013
- Chair of Council, York University Faculty of Science, Fall 2013-Winter 2014
- Co-Investigator, European Southern Observatory approved observing program *Constraining the Causes of Dramatic Variability in Newly Emerged Quasar Outflows*, Fall 2013
- Collaborator (with York graduate student J. Rogerson and postdoc P. Rodríguez Hidalgo) on approved Gemini Observatory proposal *Spectroscopy of Photometrically Varying BAL Quasars*, semester 2013B [One result featured in *Gemini Focus* magazine, April 2016 and January 2017 '2016 Year in Review' issues]
- York University Faculty of Science Committee on Examinations and Academic Standards member, Summer 2013
- Co-Investigator, Hubble Space Telescope approved observing program *Mapping the AGN Broad Line Region by Reverberation*, May 2013
- Co-Investigator, Hubble Space Telescope approved observing program *Unveiling the X-ray/UV Connection in AGN Winds: the PG 1126-041 Case Study*, May 2013

- Invited Participant, ngCFHT workshop “The Next Generation of the CFHT: A wide field spectroscopic facility for the coming decade,” March 2013
- York University Faculty of Science & Engineering Library committee member, Fall 2012-Summer 2013
- York University Dept. of Physics & Astronomy Graduate Executive committee member, Fall 2012-Summer 2013
- Collaborator (with York graduate student J. Rogerson and postdoc P. Rodríguez Hidalgo) on approved Hale 5-meter Telescope proposal *Spectroscopic Follow Up of Variable Quasars*, semester 2012B
- Collaborator (with York graduate student J. Rogerson and postdoc P. Rodríguez Hidalgo) on approved Canada-France-Hawaii Telescope proposal *Monitoring Quasar Colour Variability in Stripe 82*, semesters 2012B and 2013B
- Invited Participant, Aspen Center for Physics Summer Workshop *The Physics of Feedback Processes and their Role in Galaxy Evolution*, June 2012
- Affirmative Action Representative and Member, York University / Perimeter Institute Joint Faculty Search Committee, December 2011 - June 2012
- Accepted talk on “Broad Absorption Line Quasars with Redshifted Troughs” at the *Active Galactic Nuclei Winds in Charleston* meeting, October 2011
- York University Faculty of Science & Engineering Committee on Examinations and Academic Standards member, July 2011-August 2012
- Chair and SWG report principal author, Next Generation Canada-France-Hawaii Telescope Science Working Group on Quasars and Active Galactic Nuclei, June 2011 - November 2012
- Lead Scientist for Gemini Observatory approved observing program *Weak Line Quasars at High Redshift: Anemic Broad-line Regions or Extremely High Accretion Rates?*, semester 2011B
- Visiting Associate Professor, Cambridge University, January - June 2011
- Collaborator with Dr. Nahum Arav & colleagues on U.S. NSF proposal “BAL Outflows, A Prominent Agent of AGN Feedback: Confluence of Observations and Simulations”
- Lead Scientist for Gemini Observatory approved observing program *Using a Gravitationally Lensed Arc as an Extended Light Source*, semesters 2011A & 2012A
- Visiting Associate Professor, The Ohio State University, September - December 2010
- Attended the 38th Scientific Assembly of the Committee on Space Research in Bremen, Germany, July 20-24, 2010
- External Collaborator in the Sloan Digital Sky Survey III Collaboration for research on Broad Absorption Line Quasars, March 2010 - June 2014

- Presented poster paper at the International Astronomical Union Symposium *Co-evolution of Central Black Holes and Galaxies*, Rio de Janeiro, Brazil, August 2009
- York University Department of Physics & Astronomy Graduate Program & Admissions Committee, Summer 2009 - Summer 2010
- York University Faculty of Science & Engineering Committee on Tenure and Promotions alternate member, Summer 2009 - Summer 2010 (alternate at January 2010 meeting)
- Participant, *Observing with ALMA* Workshop at McMaster University, June 1-3, 2009
- York University Faculty of Science & Engineering Curriculum committee member, Summer 2008-Summer 2010
- York University Department of Physics & Astronomy Curriculum committee Chair, Summer 2008-Summer 2009
- Invited Participant, Aspen Center for Physics Summer Workshop *Active Galactic Nuclei: The Interplay Between Super-Massive Black Holes, Star Formation and Galaxy Evolution*, July 2008
- Canadian National Telescope Time Allocation Committee member, May 2008 - June 2010
- Co-Investigator, Hubble Space Telescope approved observing program *When degenerate stars collide: Understanding A New Explosion Phenomena*, May 2008
- Principal Applicant, NSERC Special Research Opportunity proposal *A Canadian Participation Group for the Sloan Digital Sky Survey III*, April 2007 - May 2008 (unsuccessful)
- Principal Investigator, Gemini Observatory approved observing program *Identification Spectroscopy of $5.5 < z < 6.5$ Quasar Candidates*, semesters 2008A & 2008B
- Canadian Space Agency High-Energy Astronomy Discipline Working Group Extragalactic Subcommittee Chair, January 2008 - April 2009
- York University FSE Library committee chair, Fall 2007-Summer 2009
- York University Faculty Senate Library & Information Technology Committee, 2007-2008
- Co-Applicant, NSERC Special Research Opportunity accepted proposal *Astronomical Research with the International Liquid Mirror Telescope*, September 2007 - August 2012
- Spearheaded astronomy group computer activities (cleaning of computer room, purchase of color printer, investigation of possible improvements to computing support), Aug. 2007 - Aug. 2008
- York University Faculty Advisor to the York U. Astronomy Club, 2007-2008 Academic Year
- Research mentor for winner of the 2007 Ontario Association of Physics Teachers high school physics competition (see research mentoring section), August 2007
- Faculty participant in the York/Seneca Summer Science & Technology Program involving local high school students in research (see research mentoring section), Summer 2007, 2008, 2009

- Invited Speaker, graduate student workshop *Cooking with the Sloan Digital Sky Survey*, Canadian Astronomical Society Annual Meeting, May 2007, archived at http://ara.phys.yorku.ca/sdss_casca07_files/frame.htm
- York University Division of Natural Science Faculty Advisor to the student-run NATS-AID tutoring program, April 2007-September 2008
- Member, York University Department of Physics & Astronomy Theoretical Physics Faculty Search Committee, Fall-Winter 2006-2007
- York University Faculty of Science & Engineering Research & Awards committee member, Fall 2006-Summer 2008
- Canadian Lead Scientist for Gemini Observatory approved observing program *Rapid Spectroscopy and Imaging Follow-up of Gamma-Ray Burst Afterglows*, semesters 2007A-2009A
- Co-Investigator, Hubble Space Telescope approved observing program *A Unique High Resolution Window to Two Strongly Lensed Lyman Break Galaxies*, 2007-2008
- Co-Investigator, Chandra X-ray Observatory approved observing program *Deconstructing the Accretion Disk Wind in Quasars*, 2007-2008
- York University Department of Physics & Astronomy Recruitment & Retention committee member, Fall-Winter 2006-2007 [initiated successful textbook donation at Fall 2006 high school teacher's night; participated in March Gala 2007; drafted careers webpage for dept. website]
- Co-Investigator, XMM-Newton Space Telescope approved observing program *X-ray properties of extreme UV-Fe II emitters*, 2006-2007
- James Clerk Maxwell Telescope Canadian Time Allocation Group member, July 2006 - May 2008
- Participant, *Learner-Centered Astronomy: A Teaching Excellence Workshop*, Calgary, June 2006
- Stood for membership (unsuccessfully) in the York University Faculty of Graduate Studies Appeals & Academic Honesty Committee, June 2006
- Invited Speaker, *AGN Winds in the Caribbean* conference, November 2005
- York University Division of Natural Science Advisory Council, October 2005-October 2008
- York University Department of Physics & Astronomy weekly astronomy group journal club organizer, Fall 2005-Summer 2008
- York University FSE Library committee member, Fall 2005-Fall 2007
- Colloquium Organizer, York University Dept. of Physics & Astronomy, Sept. 2004-May 2006
- Scientific Organizing Committee Member and Invited Speaker, *2004 Ringberg Castle Workshop on AGN Physics*, November 2004
- Invited talk on the Sloan Digital Sky Survey and my research using it at annual York University Physics & Astronomy Graduate Student Research Day, August 2004

- Participated in *Cosmos in the Classroom* professional meeting on astronomy teaching and education, July 2004
- Invited Speaker, *Guillermo Haro Conference on Multiwavelength AGN Surveys*, December 2003
- Visiting Research Associate, University of Wyoming, October 2003
- Co-Chair of the Scientific and Local Organizing Committees for the scientific conference “*AGN Physics with the SDSS*,” July 2003 (<http://astro.princeton.edu/~gtr/sdssagn2003/>)
- NSF Astronomy Grant Review Panel Member, March 2003
- Colloquium co-organizer, P. Universidad Católica Depto. de Astronomía (2001-2002)
- Co-Organizer, Special Session on “*Evolution of Galaxies Using Large Multicolor Samples*,” Rochester AAS meeting, June 2000
- University of Toronto Open Campus Day, Astronomy Day, and Biweekly Public Astronomy Evenings Participant, 1998-1999
- Maintainer of the Astronomy Job Rumor Page, 1996-2003
- NASA Science Speaker Volunteer (outreach to local schools), 1994-1997
- U. of Arizona Science Connection Volunteer (local grade school outreach), 1994-1995
- Boston Museum of Science Science-By-Mail Volunteer (grade school outreach), 1993-1995
- Steward Observatory Graduate Admissions Committee, 1991-1992

Graduate Supervisions (3 PhD completed; 4 MSc completed)

- Courtney Mulholland, York University Astronomy Thesis Master’s program *Quasar Wind Deceleration* (September 2018 - May 2020).
- Nabeel Ahmed, York University Astronomy Project Master’s program *Redshifted Broad Absorption-Line Quasars: Variability, Infall, and Rotating Outflows* (September 2015 - May 2017) Currently Anti Money Laundering QA Analyst at CIBC in Toronto, ON.
- Jesse Rogerson, York University Astronomy PhD program *Monitoring Broad Absorption-Line Quasar Variability* (January 2011 - May 2016) Currently Science Advisor at the Canada Aviation and Space Museum, Ottawa, ON.
- Laura Chajet, York University Astronomy PhD program, *Disk Winds and Line-Width Distributions* (December 2007-December 2015)
- Jesse Rogerson, York University Astronomy Thesis Master’s program, *Investigating Mg II Absorption in Quasar Pair Sight Lines* (September 2007-December 2010)
- Laura Chajet, York University Astronomy Thesis Master’s program, *Infrared Confirmation of $z > 5.5$ Quasar Candidates* (May 2005-November 2007)

- Banafsheh Hashemi Pour, York University Astronomy Project Master's, *Radio Properties of Broad Absorption Line Quasars* (May 2005-May 2007)
- Alireza Rafiee, York University Astronomy PhD program *Weighing Supermassive Black Holes* (September 2004-April 2010) Currently a Contract Lecturer at York University.

Graduate Supervisory and Examining Committee Memberships

- York University Department of Physics and Astronomy internal PhD supervisory committee member for Mr. Richard Bloch (program: Physics and Astronomy, supervisor: Dr. Matthew Johnson), April 2019 - April 2020
- York University Department of Physics and Astronomy internal MSc supervisory committee member for Mr. Chris Rampersad (program: Physics and Astronomy, supervisor: Dr. Adam Muzzin), April 2019
- York University Faculty of Graduate Studies Master's examining committee member for Ms. Elisabeth Smith (program: Earth and Space Sciences and Engineering, supervisor: Dr. John Moores), September 2018
- University of Waterloo Faculty of Science PhD examining committee external examiner for Mr. Mansour Karami (program: Astronomy, supervisors: Dr. Niayesh Afshordi and Dr. Avery Broderick), September 2018
- York University Faculty of Graduate Studies Master's examining committee member for Mr. Jacob Kloos (program: Earth and Space Sciences and Engineering, supervisor: Dr. John Moores), September 2016
- York University Faculty of Graduate Studies PhD examining committee member for Ms. Laura Chajet (program: Physics and Astronomy, supervisor: Dr. Patrick Hall), December 2015
- York University Faculty of Graduate Studies Master's examining committee member for Mr. Hugh Podmore (program: Earth and Space Science and Engineering, supervisor: Dr. Regina Lee), August 2015
- York University Faculty of Graduate Studies Master's examining committee member for Mr. Ryan Denault (program: Physics and Astronomy, supervisor: Dr. Marshall McCall), June 2015
- York University Department of Physics and Astronomy internal MSc supervisory committee member for Ms. Athary Alfayez (program: Physics and Astronomy, supervisor: Dr. Michael De Robertis), May 2015
- York University Faculty of Graduate Studies Master's examining committee member for Mr. Calvin Midwinter (program: Earth and Space Science and Engineering, supervisor: Dr. Mike Daly), March 2015
- York University Faculty of Graduate Studies Master's examining committee chair for Ms. Neda Hejazi (program: Physics and Astronomy, supervisor: Dr. Michael De Robertis), October 2014

- York University Department of Physics and Astronomy internal PhD supervisory committee member for Mr. George Conidis (program: Physics and Astronomy, supervisor: Dr. Marshall McCall), 2014-2016
- York University Department of Physics and Astronomy internal MSc supervisory committee member for Ms. Neda Hejazi (program: Physics and Astronomy, supervisor: Dr. Michael De Robertis), May 2013
- York University Department of Physics and Astronomy internal MSc supervisory committee member for Mr. George Conidis (program: Physics and Astronomy, supervisor: Dr. Marshall McCall), March 2013
- York University Faculty of Graduate Studies Master's examining committee chair for Ms. Lianne Manzer (program: Physics and Astronomy, supervisor: Dr. Michael De Robertis), December 2012
- York University Faculty of Graduate Studies PhD examining committee member for Mr. Vyacheslav Galymov (program: Physics and Astronomy; supervisor: Dr. Sampa Bhadra), March 2012
- York University Faculty of Graduate Studies PhD examining committee member for Ms. Robin Metcalfe (program: Physics and Astronomy; supervisor: Dr. Marshall McCall), December 2011
- York University Faculty of Graduate Studies PhD examining committee member for Ms. Sunne Dong (program: Physics and Astronomy; supervisor: Dr. Michael DeRobertis), November 2011
- York University Department of Physics and Astronomy internal MSc supervisory committee member for Ms. Lianne Manzer (program: Physics and Astronomy, supervisor: Dr. Michael De Robertis), September 2011
- York University Faculty of Graduate Studies Master's examining committee Chair for Mr. Stuart Dack (program: Physics and Astronomy; supervisor: Dr. Marshall McCall), August 2011
- York University Faculty of Graduate Studies PhD examining committee member for Mr. Brad Schultz (program: Physics and Astronomy; supervisor: Dr. William van Wijngaarden), May 2010
- York University Faculty of Graduate Studies Master's examining committee member for Mr. Piotr Wenderski (program: Earth and Space Science; supervisor: Dr. Jinjun Shan), October 2009
- York University Faculty of Graduate Studies PhD examining committee Chair for Mr. Chris Ryan (program: Physics and Astronomy; supervisor: Dr. Michael De Robertis), January 2009
- York University Faculty of Graduate Studies Master's examining committee member for Ms. Hua Lin (program: Earth and Space Science; supervisor: Dr. Jinjun Shan), November 2008
- York University Faculty of Graduate Studies PhD examining committee member for Mr. Jerome Whyte (program: Physics and Astronomy; supervisor: Dr. Scott Menary), September 2008
- York University Faculty of Graduate Studies Master's examining committee member for Mr. Peter Luca (program: Physics and Astronomy; supervisor: Dr. Norbert Bartel), September 2007

- York University Faculty of Graduate Studies PhD examining committee Chair for Ms. Svitlana Prada (program: Physics; supervisor: Dr. Diethard Bohme), July 2007
- York University Faculty of Graduate Studies PhD examining committee member for Mr. Ovidiu Vaduvescu (program: Physics and Astronomy; supervisor: Dr. Marshall McCall), Nov. 2005
- York University Faculty of Graduate Studies Master's examining committee member for Mr. Louis-Philippe Caron (program: Physics and Astronomy; supervisor: Dr. Wayne Cannon), Oct. 2004

Postdoc, Graduate, Undergraduate and High School Student Research Mentoring

- May 2020-August 2020: supervised recent York graduate Dyuman Bhattacharya (as an NSERC USRA recipient) on a project to derive the fundamental emission components of quasars, including deriving matrix derivative updates accounting for multiplicative wavelength-dependent attenuation.
- **May 2019-August 2019, May 2020-present:** supervised York undergraduate Ghassan Sarrouh (first as a Dean's Undergraduate Research Award recipient) on a project to derive the fundamental emission components of quasars using advanced statistical techniques.
- May 2019-July 2019: supervised York undergraduate Romina Bahrami on a 12-week project to derive the fundamental emission components of quasars using advanced statistical techniques, specifically Complex Nonnegative Matrix Factorization.
- September 2018-May 2020: supervising York Master's student Courtney Mulholland on a project to study deceleration of BAL quasar outflows as they sweep up gas in the surrounding galaxy.
- November 2016-April 2017: supervised York undergraduate Ghassan Sarrouh on visualization of the offset of Earth's oceanic tidal bulge from the Earth-Moon line and on calculation of the radial temperature structure of accretion disks.
- September 2015-May 2017: supervised York Master's student Nabeel Ahmed on projects to study and model the absorption-line and variability properties of redshifted BAL quasars and the emission-line and variability properties of weak-lined quasars.
- July 2015: supervised Toronto high school student (and Ontario Association of Physics Teachers Grade 11 Physics Contest 2nd-place finisher) Abtin Ameri on projects to search for variable quasars by comparing spectra from the SDSS and BOSS databases, and to measure unexpected emission-line shifts in certain quasars; he is a co-author on the paper reporting the latter.
- May 2015-July 2015: co-supervised (with York postdoctoral researcher Paola Rodríguez Hidalgo) U. of Toronto undergraduates Abdul Khatri and Viraja Khatu on searches for, and studies of, high-velocity broad absorption lines in distant and nearby quasars. Mr. Khatri and Ms. Khatu will be co-authors on the resulting paper(s).
- May 2015-July 2015: supervised Mitacs Globalink Intern Shivam Pandey on a project to derive the fundamental emission components of quasars using Blind Source Separation statistical techniques, and to use those components to reconstruct observed quasar spectra free of absorption and with reduced noise. Mr. Pandey will be a co-author on the resulting paper(s), and is now a graduate student at U. Penn.

- March 2015-July 2015: supervised York undergraduate Patrik Pirkola on analyzing and interpreting observations of ‘disappearing FeLoBAL’ quasars; Mr. Pirkola is a co-author on the resulting paper.
- March 2015-July 2015: supervised York undergraduate Natalee Galati on constructing and plotting light curves and spectral energy distributions for quasars as part of a study of ‘disappearing FeLoBAL’ quasars; Ms. Galati is a co-author on the resulting paper.
- March 2015-May 2015: co-supervised (with York postdoctoral researcher Alireza Rafiee) high school student Shruthi Sailesh in updating the Scale Model of the Solar System at York website.
- March 2015-May 2015: supervised York postdoctoral researcher Alireza Rafiee in his role as lead author on a peer-reviewed paper investigating three ‘disappearing FeLoBAL’ quasars whose broad absorption has greatly decreased in the recent past.
- August 2014-August 2015: supervised York undergraduate student Nabeel Ahmed on projects involving reduction and analysis of spectroscopic data from the Gemini telescopes.
- June 2013-September 2013: supervised Yanzhou University undergraduate student Yue (Cory) Zhao (now a graduate student at the University of Alberta) as a Mitacs Globalink intern to work on projects on an optical transient and on quasar spectroscopic and photometric variability.
- May 2013-August 2013: supervised York undergraduate student (and NSERC USRA recipient) Emil Noordeh on projects animating the early orbit of the Moon, modelling quasar accretion disks.
- October 2012-May 2015: supervised York undergraduate Patrik Pirkola on a project to describe a demonstration of Martian gravity on Earth; Mr. Pirkola is first author on the resulting paper.
- May 2012-May 2013: supervised York undergraduate student Erik Weiss on several work-study projects modelling quasar accretion disks.
- January 2012-July 2015: supervising York postdoctoral researcher Paola Rodríguez Hidalgo on numerous projects involving broad absorption line quasars.
- January 2011-May 2016: supervised York graduate student Jesse Rogerson on a PhD project to study BAL quasar variability.
- Fall 2011: supervised York graduate student Neda Hejazi in a semester-long research project course focused on the radio properties of BAL quasars.
- September-October 2010: supervised York undergraduate student Ted Rudyk on a project to search for long-term colour variability of ‘overlapping-trough’ broad absorption line quasars; this work contributed to Rafiee et al. (2016) and may be incorporated in future publications.
- May-July 2010: supervised York postdoctoral researcher Alireza Rafiee on research projects stemming from his PhD thesis work with me.
- July 2009: supervised high school student and York Summer Science and Technology Program participant Osato Idemudia in constructing a website for York’s Scale Model of the Solar System: <http://solarsystem.blog.yorku.ca/>

- May-August 2009: supervised York/U. of Toronto undergraduate student (and NSERC USRA recipient) Konstantin Anosov on a study of dramatic spectral variability in an ‘overlapping-trough’ broad absorption line quasar; Mr. Anosov is 2nd author on the resulting paper.
- July-August 2008: with Master’s student Jesse Rogerson, supervised high school students Haripraneith Kugan (1 week) and Harvinderpal Ghotra (3 weeks) to identify *R*-band dropout objects (candidate high-redshift quasars and brown dwarfs) in the Red-Sequence Cluster Survey.
- December 2007-December 2015: supervised York graduate student Laura Chajet on a PhD project to predict quasar broad emission line profiles for a variety of disk wind outflow scenarios.
- September 2007-December 2010: supervised York master’s student Jesse Rogerson on a project using X-ray flux limits on two unusual BAL quasars to constrain their outflows’ physical properties. and on a project to constrain the spatial distribution of gas producing intervening Mg II absorption in quasar spectra using closely spaced quasar sightlines.
- August-October 2007: worked with York undergraduate Aaron Maxwell to rule out possible identifications for unusual molecular absorption bands in the spectra of certain white dwarf stars. Mr. Maxwell is 2nd author on a paper about these objects (Hall & Maxwell 2008).
- August 2007: worked with Ottawa high school student (and Ontario Association of Physics Teachers Grade 11 Physics Contest winner) Bill Long to classify all spectra classified UNKNOWN by the Sloan Digital Sky Survey, and to examine high-redshift quasar candidates.
- July 2007: worked with Toronto high school student Akshay Awal to classify all spectra classified UNKNOWN by the Sloan Digital Sky Survey. Mr. Awal discovered a very unusual white dwarf, and is a coauthor on the paper about this object (Hall et al. 2008).
- May 2007-Aug. 2007: worked with York undergraduate (and NSERC USRA recipient) Rachel Ward to refine and extend the disk wind model of Murray & Chiang, use it to predict quasar broad emission line profiles, and to search for regions of parameter space for which the predicted profiles match the observations. A paper is in prep, and Ms. Ward won second place for her talk on this work at the 2007 Canadian Undergraduate Physics Conference.
- May 2006-Sept. 2006: worked with York undergraduate (and NSERC USRA recipient) Sarah Sadavoy to analyze high-resolution spectra of quasar outflows, resulting in a paper (Hall, Sadavoy et al. 2007) and a talk by Ms. Sadavoy at the 2006 Canadian Undergraduate Physics Conference.
- May 2005-Nov. 2007: supervised York graduate student Laura Chajet on a Master’s project to select candidate very high redshift quasars from near-infrared imaging data. Ms. Chajet presented her work at a meeting of the Canadian Astronomical Society.
- May 2005-May 2007: supervised York graduate student Banafsheh Hashemi-Pour on a Master’s project to study the radio emission of broad absorption line quasars.
- May 2005-Aug. 2005: worked with York undergraduate Rachel Ward on reduction of near-infrared imaging of candidate very high redshift quasars.
- May 2005-Aug. 2005: worked with York undergraduate Sandy Hsu on analysis of photo- and spectro-polarimetry of broad absorption line quasars.

- September 2004-April 2010: supervised York graduate student Alireza Rafiee on a PhD project to study the black hole masses of quasars. Mr. Rafiee has presented results of his work at three meetings of the Canadian Astronomical Society and two meetings of the American Astronomical Society. At the 211th meeting of the AAS in Austin, Texas in January 2008, Mr. Rafiee received a Chambliss Astronomy Achievement Student Award Honorable Mention for his poster “Quasar Lifetimes and Black Hole Spins.” These awards “recognize exemplary research by undergraduate and graduate students.” Mr. Rafiee also travelled to Kitt Peak National Observatory in November 2007 to help conduct observations for a related wide-field infrared survey for quasars.
- Dec. 2003-May 2006: worked with Penn State undergraduate Jon Trump (advisor: Don Schneider) to catalog intrinsic absorbers – both traditional BAL troughs and narrower or lower-velocity systems – in SDSS quasars, resulting in Trump et al. 2006.
- September 2003 - July 2004: worked with Penn State graduate student Junfeng Wang (advisor: Jian Ge) on several SDSS quasars whose spectra show the 2175 Å dust extinction bump from a strong intervening metal-line absorption system along the line of sight (Wang, Hall et al. 2004; Wang et al. 2005).
- May 2003-Aug. 2005: worked with Toronto graduate student Adam Muzzin (advisor: Howard Yee) on reducing and analyzing near-IR observations of Canadian Network for Observational Cosmology galaxy clusters, resulting in Muzzin et al. 2007ab.
- June 2003: worked with Princeton undergraduate Martin Niederste-Ostholt, resulting in his coauthorship on the SDSS DR1 Quasar Catalog paper (Schneider et al. 2003) and third authorship on Hall et al. “A Quasar Without Broad Lyman-alpha Emission,” AJ, August 2004.
- May 2003 - June 2004: collaborated with Princeton undergraduate Phil Hopkins (advisor: Michael Strauss) to publish his junior thesis work, which confirmed that dust reddening is the primary explanation for red SDSS quasars and showed that reddening with SMC-like extinction curves dominates the reddening observed toward quasars (Hopkins, Strauss, Hall et al. 2004).
- November - December 2002: worked with Catolica undergraduate Juan Esteban Gonzalez on preparing for, conducting, and analyzing data from IR imaging observing runs. Excellent-seeing data on one gravitational lens was incorporated in Winn, Hall & Schneider (2003).
- April 2002 - August 2003: collaborated with Penn State undergraduate Tim Reichard (advisor: Don Schneider), later a graduate student at Johns Hopkins, on cataloging and studying BAL quasars from the SDSS (Reichard et al. 2003ab).
- September 2001: worked with Catolica undergraduate Claudio Navarro on preparing for and conducting IR imaging and optical spectroscopic observing runs. Data to be incorporated in “A CTIO Survey for Active Galactic Nuclei from 2MASS,” Hall et al., in prep.
- June - Sept. 2000: worked with Toronto graduate student Wayne Barkhouse (advisor: Howard Yee) on cataloging known AGN in the Two-Micron All-Sky Survey (Barkhouse & Hall 2001).

Graduate Teaching

- Fall 2018: York University Physics 5290 ‘Extragalactic Astronomy’, including development of online projects using SQL and Python to manipulate astronomical ‘Big Data’ databases from the SDSS for interpretation by students.
- Winter 2016: York University Physics 4070/5090 ‘Stars and Nebulae’
- Winter 2014: York University Physics 4070/5090 ‘Stars and Nebulae’
- Fall 2012: York University Physics 5290 ‘Extragalactic Astronomy’
- Winter 2012: York University Physics 4070/5090 ‘Stars and Nebulae’
- Winter 2010: York University Physics 4070/5090 ‘Stars and Nebulae’
- Fall 2008 - Winter 2009: York University Physics 4270/5390 ‘Astronomical Techniques’
- Winter 2008: York University Physics 4070/5090 ‘Stars and Nebulae’
- Fall 2006 - Winter 2007: York University Physics 4270/5390 ‘Astronomical Techniques’ graduate/advanced undergraduate laboratory course (year-long course required for astronomy graduate students and astronomy stream physics majors), including development of extrasolar planet transit observing project featured in Y-File Apr. 30, 2007: <http://www.yorku.ca/yfile/archive/index.asp?Article=8366>
- Winter 2006: York University Physics 4070/5090 ‘Stars and Nebulae’ graduate/advanced undergraduate course on Stellar Physics, Radiative Transfer and Interstellar Matter (one-term course required for astronomy graduate students and honours astronomy stream physics majors)
- 2002: P. U. Católica Student Seminar Series on Quasars (1/6-term course)
- 2000: U. Toronto minicourse on Active Galactic Nuclei (1/3-term course)

Undergraduate Teaching

- Winter 2019, Winter 2020: Physics 2030 ‘Computational Methods for Physicists and Engineers’
- Winter 2019, Fall 2020: Natural Sciences 1570 ‘Exploring the Solar System’
- Winter 2017: Physics 1070 ‘Fundamentals of Astronomy’ (one-term introductory course open to any qualifying student; required for astronomy stream physics majors), including introduction of online telescope network usage to obtain images for interpretation by students
- Fall 2016: Natural Sciences 1740 ‘Astronomy’ (fall term of two-term introductory course for students outside the Faculty of Science), including re-introduction of clicker quizzes and design and testing of a few new in-class activities
- Fall 2015: Physics 1070 ‘Fundamentals of Astronomy’ (one-term introductory course open to any qualifying student; required for astronomy stream physics majors)
- Winter 2015: Natural Sciences 1740 ‘Astronomy’ (second term of a two-term introductory course for students outside the Faculty of Science), including continued design and testing of new in-class activities

- Fall 2014: Physics 1070 'Fundamentals of Astronomy' (one-term introductory course open to any qualifying student; required for astronomy stream physics majors), including application of various active learning approaches and development of some in-class activities
- Fall 2013 - Winter 2014: Natural Sciences 1740 'Astronomy' (two-term introductory course for students outside the Faculty of Science), including continued design and testing new in-class activities
- Fall 2012 - Winter 2013: Natural Sciences 1740 'Astronomy' (two-term introductory course for students outside the Faculty of Science), including continued design and testing new in-class activities
- Summer 2012: Physics 4310 'Physics or Astronomy Project' (one-term research project course for undergraduate student Anisa Haghighi N. on modelling inhomogeneous quasar accretion disks.)
- Fall 2011 - Winter 2012: Natural Sciences 1740 'Astronomy' (two-term introductory course for students outside the Faculty of Science), including design and testing of a dozen new in-class activities and two new lab exercises, since published in my book *Astronomy Activities Manual* along with activities previously published by other Kendall Hunt authors.
- Fall 2009 - Winter 2010: Natural Sciences 1740 'Astronomy'
- Winter 2009: Physics 4310 'Physics or Astronomy Project' (one-term research project course for undergraduate students Marie-Claude Boivin and Meg Russell on MATLAB generation and analysis of line emission profiles from simulated disk wind models in a certain range of parameter space)
- Fall 2008 - Winter 2009: Natural Sciences 1740 'Astronomy'
- Winter 2008: Natural Sciences 1740 'Astronomy' (two-term introductory course for students outside the Faculty of Science), including development of seven new lab exercises (out of eight in the class) over 4 years, two semesters' worth of WebCT quizzes over 2 years, and two semesters' worth of in-class 'clicker' questions over 2 years.
- Fall 2007: Physics 1070 'Fundamentals of Astronomy'
- Fall 2006 - Winter 2007: Natural Sciences 1740 'Astronomy'
- Fall 2005 - Winter 2006: Natural Sciences 1740 'Astronomy'
- Fall 2005: Physics 4310 'Physics or Astronomy Project' (one-term research project course for undergraduate student Victor Arora on the optical/near-IR spectra of two unusual broad absorption line quasars, resulting in a poster by Mr. Arora at the 2006 Canadian Astronomical Society Annual Meeting)
- Winter 2005: Physics 1070 'Fundamentals of Astronomy'
- Fall 2004: Natural Sciences 1740 'Astronomy'

External Research Funding

- 9/18-2/19 NSERC Engage Grant *Integrating an Analytical Business Intelligence Module into the Medical Confidence Machine Learning System* (\$24,977)
- 5/17-4/22 NSERC Discovery Grant *Constraining the Properties of Quasars and their Outflows Using Variability* (\$125,000)**
- 5/12-4/17 NSERC Discovery Grant *Understanding Quasar Outflows* (\$160,000)
- 7/09-6/14 Ontario Early Researcher Award *Outflows from disks of matter orbiting supermassive black holes* (\$100,000, matched with \$50,000 from York University)
- 5/07-4/12 NSERC Discovery Grant *Connections Between Active Galactic Nuclei and Galaxy Bulges* (\$121,400)
- 5/05-4/07 NSERC Discovery Grant *Intrinsic Absorption in Sloan Digital Sky Survey Quasars* (\$45,800)
- 8/04-7/06 NSF Extragalactic Astronomy Grant *Intrinsic Absorption in SDSS Quasars* (approved but declined)
- 9/03-9/04 XMM-Newton A02 program *X-rays from Extreme Broad Absorption Line Quasars* (US\$38,000; Budgetary PI: Dr. Mike Brotherton)
- 5/03-4/04 *A Conference on Active Galactic Nuclei Physics with the Sloan Digital Sky Survey* (US\$6,000 to support the attendance of postdocs and graduate & undergraduate students actively working in the field; co-PI with Dr. Gordon Richards)
- 12/02-12/03 Chandra AO4 program *X-rays from Extreme Broad Absorption Line Quasars* (US\$35,000; Budgetary PI: Dr. Mike Brotherton)
- 3/01-2/03 Chilean FONDECYT Research Grant *Toward an Unbiased View of Active Galactic Nuclei: Infrared Selection and Low Luminosities at High Redshift* (~US\$25,000)

Internal Research Funding

- 3/19-8/19 York University Faculty of Science Minor Research Grant, 2019 (\$4,190)
- 4/18-4/18 York University Faculty of Science Minor Research Grant, 2018 (\$200,000 for membership in the Sloan Digital Sky Survey V)
- 10/11-9/12 York University Faculty of Science & Engineering Established Researcher Award (\$3,000)
- 7/04-7/11 York University Start-Up Grant (\$33,000)

Publications (Lifetime Summary)

ORCID: 0000-0002-1763-5825

Books: 3 (partial authorship/editorship)

Chapters in books: 0

Papers in refereed journals: 232 (First author: 28)

Papers in refereed conference proceedings: 52 (First author: 10)

Technical reports: 0

Abstracts & other unrefereed contributions: 98 (First author: 20)

Other: 1

Independent Papers by Research Group Members: 4

Publications

Books

- “Solar System Activities Manual,” **Patrick Hall**, 2018 (Kendall Hunt: Des Moines)
Includes three new in-class activities for introductory astronomy courses, plus material from my 2012 workbook.
- “Astronomy Activities Manual,” **Patrick Hall**, 2012 (Kendall Hunt: Des Moines)
I created almost 20 activities (laboratory and in-class) for this workbook for introductory astronomy courses, which includes activities previously published by other Kendall Hunt authors.
- “AGN Physics with the Sloan Digital Sky Survey,” ed. G. T. Richards & **P. B. Hall**, 2004 (ASP: San Francisco) [reviewed by Ross McLure in *The Observatory: A Review of Astronomy*, vol. 125, no. 1184, pp. 59-60 (2005)]

Papers in Refereed Journals

(Key: AAS - American Astronomical Society; AJ - The Astronomical Journal; ApJ - The Astrophysical Journal; ApJL - The Astrophysical Journal Letters; ApJS - The Astrophysical Journal Supplement Series; A&A - Astronomy & Astrophysics; A&AL - Astronomy & Astrophysics Letters; BAAS - Bulletin of the American Astronomical Society; JAAVSO - Journal of the American Association of Variable Star Observers; MNRAS - Monthly Notices of the Royal Astronomical Society; PASJ - Proceedings of the Astronomical Society of Japan; PASP - Proceedings of the Astronomical Society of the Pacific)

Submitted

(Key to paper title fonts: **First Author**; *Heavy Involvement*; Some Contribution)

(Key to author fonts: Highly Qualified Personnel collaborators at York are underlined)

- “Space Telescope and Optical Reverberation Mapping Project. XII. Broad-Line Region Modeling of NGC 5548,” Williams, et al. 2020, in press
I am a member of the AGN STORM project.

In Press

My contributions while at York to papers on which I am not the first author are discussed in italics.

- “Space Telescope and Optical Reverberation Mapping Project. IX. Velocity-Delay Maps for Broad Emission Lines in NGC 5548,” Horne, et al. 2020, ApJ, in press (arXiv:2003.01448)
I provided feedback on the presentation of results.

Published

- “The Sloan Digital Sky Survey Reverberation Mapping Project: Estimating Masses of Black Holes in Quasars with Single-Epoch Spectroscopy,” Dalla Bontà, et al. 2020, ApJ, 903:112 (28pp) (arXiv:2007.02963)
I provided feedback on the presentation of results.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: How Broad Emission Line Widths Change When Luminosity Changes,” Wang, et al. 2020, ApJ, 903:51 (30pp) (arXiv:2006.06178)
I am a member of the SDSS-RM collaboration.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Mg II Lag Results from Four Years of Monitoring,” Homayouni et al. 2020, ApJ, 901:55 (14pp) (arXiv:2005.03663)
I provided feedback on the presentation of results.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Photometric g and i Light Curves,” Kinemuchi, **Hall**, et al. 2020, AAS Journals, in press (arXiv:2007.05160)
I was the PI of the CFHT proposal which provided much of the data in this paper, was involved in the analysis, and was heavily involved in the writeup.
- “Survey of Extremely-High-Velocity Outflows in Quasars,” Paola Rodríguez Hidalgo, Abdul Moiz Khatri, **Patrick B. Hall**, Sean Haas, Carla Quintero, Viraja Khatu, Griern Kowash, & Norm Murray 2020, ApJ, 896, 151 (arXiv:2006.05633)
I was heavily involved in all aspects of this research.
- “An Extreme X-ray Variability Event of a Weak-Line Quasar,” Ni, Brandt, Yi, Luo, Timlin, **Hall**, Liu, Plotkin, Shemmer, Vito, & Wu 2020, ApJL, 889, L37 (arXiv:2001.08216)
I contributed to the interpretation of the results reported in this paper.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Initial C IV Lag Results from Four Years of Data,” Grier, Shen, Horne, Brandt, Trump, **Hall**, et al. 2019, ApJ, 887:1 (38pp) (arXiv:1904.03199)
I provided feedback and clarification on the presentation of results.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Accretion and Broad Emission Line Physics from a Hypervariable Quasar,” Dexter, Xin, Shen, Grier, Liu, Gezari, McGreer, Brandt, **Hall**, Horne, Simm, Merloni, Green, Vivek, Trump, Homayouni, Peterson, Schneider, Kinemuchi, Pan, & Bizyaev 2019, ApJ, 885:44 (11pp) (arXiv:1906.10138)
I provided feedback and clarification on the interpretation of results.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Comparison of Lag Measurement Methods with Simulated Observations,” Li, Shen, Brandt, Grier, **Hall**, Ho, Homayouni, Horne, Schneider, Trump, Starkey et al. 2019, ApJ, 884:119 (21pp) (arXiv:1909.03092)
I provided feedback on the presentation of results.

- “The Sloan Digital Sky Survey Reverberation Mapping Project: Improving Lag Detection with an Extended Multi-Year Baseline,” Shen, Grier, Horne, Brandt, Trump, **Hall** et al. 2019, ApJL, 883, L14 (arXiv:1908.00027) *I provided feedback and clarification on the presentation and interpretation of results.*
- “Space Telescope and Optical Reverberation Mapping Project. VIII. Time Variability of Emission and Absorption in NGC 5548 Based on Modeling the Ultraviolet Spectrum,” Kriss et al. 2019, ApJ, 881, 153 (arXiv:1907.03874)
I provided feedback and clarification on the presentation of results.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Accretion-Disk Sizes From Continuum Lags,” Homayouni, Trump, Grier, Shen, Brandt, Starkey, **Hall**, Horne, Kinemuchi, Li, McGreer, Sun, Ho, & Schneider 2018, ApJ, 880, 126 (arXiv:1806.08360)
I contributed to the analysis, understanding, and presentation of these results.
- “The Extremely Luminous Quasar Survey in the Pan-STARRS 1 Footprint (PS-ELQS),” Schindler, Fan, Huang, Yue, Yang, **Hall**, Wenzl, Hughes, Litke, & Rees 2019, ApJS, 243, 5 (arXiv:1905.04069)
I provided human-expert identification of BAL quasars and their redshifts.
- “Variability Of Low-Ionization Broad Absorption Line Quasars Based On Multi-Epoch Spectra From The Sloan Digital Sky Survey,” Yi, Brandt, **Hall**, Vivek, Grier, Filiz Ak, Schneider, & McGraw 2019, ApJS, 242, 28 (arXiv:1905.01573)
I provided extensive feedback to modeling approaches and interpretation of results in this paper.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Sample Characterization,” Shen, **Hall**, Horne, Zhu, McGreer, Simm, Trump, Kinemuchi, Brandt, Green, Grier, Guo, Ho, Homayouni, Jiang, Li, Morganson, Petitjean, Richards, Schneider, Starkey, Wang, Chambers, Kaiser, Kudritzki, Magnier, & Waters 2019, ApJS, 241, 34 (1tp) (arXiv:1810.01447)
I am a founding member of this project and led the CFHT imaging observations for it.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Systematic Investigations of Short-Timescale CIV Broad Absorption Line Variability,” Hemler, Grier, Brandt, **Hall**, Horne, Shen, Trump, Schneider, Vivek, Bizyaev, Oravetz, Oravetz, & Pan 2019, ApJ, 872, 21 (21pp) (arXiv:1811.00010)
I contributed greatly to the analysis of these spectra and the interpretation of the observed variability.
- “X-ray and multi-epoch optical/UV investigations of BAL to non-BAL quasar transformations,” Sameer, Brandt, Anderson, Filiz Ak, Grier, **Hall**, Vivek, Ahmed, Luo, Myers, Rodríguez Hidalgo, Ruan, & Schneider 2019, MNRAS, 482, 1121 (14pp) (arXiv:1810.03625)
I analysed optical spectra for this project and contributed to the interpretation of the results.
- “Connecting the X-ray properties of weak-line and typical quasars: testing for a geometrically thick accretion disk,” Ni, Brandt, Luo, **Hall**, Shen, Anderson, Plotkin, Richards, Schneider, Shemmer & Wu 2018, MNRAS, 480, 5184 (19pp) (arXiv:1807.08757)
I analysed optical spectra for this project and contributed to the interpretation of the results.

- “Redshifted broad absorption line quasars found via machine-learned spectral similarity,” Reis, Poznanski, & **Hall** 2018, MNRAS, 480, 3889 (9pp) (arXiv:1805.09829)
I provided human-expert identification of redshifted BAL quasars and interlopers to refine the accuracy of the machine learning algorithm used herein.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Quasar Host Galaxies at $z < 0.8$ from Image Decomposition,” Yue, Jiang, Shen, **Hall**, Yu, Schneider, Ho, Horne, Petitjean, & Trump 2018, ApJ, 863, 21 (17pp) (arXiv:1806.09083)
I was PI of the CFHT proposal which obtained the data used in this project.
- “Emergence and Variability of Broad Absorption Line Quasar Outflows,” Rogerson, **Hall**, Ahmed, Rodríguez Hidalgo, Brandt, & Filiz Ak 2017, ApJ, 862, 1 (22p) (arXiv:1807.07594)
I guided and supervised this work, which was a part of Dr. Rogerson’s PhD thesis at York.
- “The Sloan Digital Sky Survey Quasar Catalog: fourteenth data release,” Pâris et al. 2018 (40 authors), A&A, 613, A51 (17pp) (arXiv:1712.05029)
I contributed to the identification of some quasars in this publication.
- “The Fourteenth Data Release Of The Sloan Digital Sky Survey: First Spectroscopic Data From The Extended Baryon Oscillation Spectroscopic Survey And From The Second Phase Of The Apache Point Observatory Galactic Evolution Experiment,” Abolfathi et al. 2017, ApJS, 235:42 (19pp) (arXiv:1707.09322)
I am an External Collaborator in the SDSS-IV collaboration.
- “Spectroscopic characterization of galaxy clusters in RCS-1: spectroscopic confirmation, redshift accuracy, and dynamical mass-richness relation,” Gilbank et al. 2018, MNRAS, 476, 1991-2012
I contributed to obtaining the observations for this paper.
- “Non-Blackbody Disks Can Help Explain Inferred AGN Accretion Disk Sizes,” **Hall**, Sarrouh & Horne 2018, ApJ, 854:93 (10pp) (arXiv:1705.05467)
- “The Sloan Digital Sky Survey reverberation mapping project: H-alpha and H-beta reverberation measurements from first-year spectroscopy and photometry,” Grier et al. 2017 (42 authors), ApJ, 851:21 (22pp) [Erratum: ApJ, 868, 76 (2018)] (arXiv:1711.03114)
I was the principal investigator for the CFHT photometry used in this paper.
- “The Time-Domain Spectroscopic Survey: Target Selection for Repeat Spectroscopy,” MacLeod et al. (38 authors) 2017, AJ, 155:6 (17pp) (arXiv:1706.04240)
I selected a subset of the targets discussed in this paper.
- “Optical linear polarization measurements of quasars obtained with the 3.6 m telescope at the La Silla Observatory,” Hutsemékers, **Hall** & Sluse 2017, A&A, 606, A101 (4pp) (arXiv:1709.01309)
I contributed to gathering the data presented in this paper.
- “Space Telescope and Optical Reverberation Mapping Project. VII. Understanding the UV anomaly in NGC 5548 with X-Ray Spectroscopy,” Mathur et al. (150 authors) 2017, ApJ, 846:55 (9pp) (arXiv:1704.06345)
I contributed to the discussion of the results of this paper.

- “Broad absorption line disappearance and emergence using multiple-epoch spectroscopy from the Sloan Digital Sky Survey,” McGraw, Brandt, Grier, Filiz Ak, **Hall**, Schneider, Anderson, Green, Hutchinson, MacLeod & Vivek 2017, MNRAS, 469, 3163-3184 (arXiv:1705.03019)
I contributed to the discussion of the results of this paper.
- “X-ray Insights into the Nature of Quasars with Redshifted Broad Absorption Lines,” Zhang, Brandt, Ahmed, **Hall**, Luo, Anderson, Filiz Ak, Petitjean, Schneider, Shen & Srianand 2017, ApJ, 839, 101 (arXiv:1703.08180)
I contributed to the interpretation and discussion of the results of this paper.
- “Space Telescope and Optical Reverberation Mapping Project. V. Optical Spectroscopic Campaign and Emission-Line Analysis for NGC 5548,” Pei et al. (156 authors) 2017, ApJ, 837, 131 (arXiv:1702.01177)
I am a member of the AGN STORM project.
- “Magnetohydrodynamic Disc Winds and Line Width Distributions II,” Chajet & **Hall** 2017, MNRAS, 465, 1741 (arXiv:1611.01067)
I guided and supervised this work, which was a part of Dr. Chajet’s PhD thesis at York.
- “Space Telescope and Optical Reverberation Mapping Project. VI. Reverberating Disk Models for NGC 5548,” Starkey et al. (93 authors) 2017, ApJ, 836, 65 (arXiv:1611.06051)
I contributed some clarification and discussion to the text of the paper.
- “The Sloan Digital Sky Survey Quasar Catalog: twelfth data release,” Pâris et al. (46 authors) 2017, A&A, 597, A79 (25pp) (arXiv:1608.06483)
I contributed to the identification of some quasars in this publication.
- “C IV Broad Absorption Line Acceleration in Sloan Digital Sky Survey Quasars,” Grier, Brandt, **Hall**, Trump, Filiz Ak, Anderson, Green, Schneider, Sun, Vivek, Beatty, Brownstein & Roman-Lopes 2016, ApJ, 824, 130 (22pp) (arXiv:1604.07410)
I contributed derivations, text, analysis, and interpretation to this publication.
- “Space Telescope and Optical Reverberation Mapping Project. IV. Anomalous Behavior of the Broad Ultraviolet Emission Lines in NGC 5548,” Goad et al. (101 authors) 2016, ApJ, 824, 11 (10pp) (arXiv:1603.08741)
I helped revise the proposal that yielded the Hubble Space Telescope data studied herein.
- “Vanishing Absorption and Blueshifted Emission in FeLoBAL Quasars,” Rafiee, Pirkola, **Hall**, Galati, Rogerson, & Ameri 2016, MNRAS, 459, 2472-2485 (arXiv:1604.06977)
I contributed figures, text, analysis, and interpretation to this publication.
- “Space Telescope and Optical Reverberation Mapping Project. III. Optical Continuum Emission and Broad-Band Time Delays in NGC 5548,” Fausnaugh et al. (97 authors) 2016, ApJ, 821, 56 (25pp) (arXiv:1510.05648)
I helped revise the proposal that yielded the Hubble Space Telescope data studied herein.
- “Multi-Epoch Observations of Extremely High-Velocity Emergent Broad Absorption,” Rogerson, **Hall**, Rodríguez Hidalgo, Pirkola, Brandt & Filiz Ak 2016, MNRAS 457 (1): 405-420 (arXiv:1509.02842)
I contributed to the analysis and interpretation of the results in this publication.

- “The Sloan Digital Sky Survey Reverberation Mapping Project: First Broad-Line $H\beta$ and Mg II Lags at $z \geq 0.3$ from Six-Month Spectroscopy,” Shen, Horne, Grier, Peterson, Denney, Trump, Sun, Brandt, Kochanek, Dawson, Green, Greene, **Hall**, Ho, Jiang, Kinemuchi, McGreer, Petitjean, Richards, Schneider, Strauss, Tao, Wood-Vasey, Zu, Pan, Bizyaev, Ge, Oravetz & Simmons 2016, ApJ, 818, 30 (17pp) (arXiv:1510.02802)
I contributed comments on the paper text and content.
- “Demonstrating Martian Gravity,” Pirkola & **Hall** 2015, Physics Education, 50 (6), 643-645 (arXiv:1602.06858)
I guided Mr. Pirkola in the outline and development of this publication.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Ensemble Spectroscopic Variability of Quasar Broad Emission Lines,” Sun, Trump, Shen, Brandt, Dawson, Denney, **Hall**, Ho, Horne, Jiang, Richards, Schneider, Bizyaev, Kinemuchi, Oravetz, Pan, & Simmons 2015, ApJ, 811, 42 [19pp] (arXiv:1506.07886)
I contributed to the refinement of the analysis methods used in this paper.
- “Space telescope and optical reverberation mapping project. II. Swift and HST Reverberation Mapping of the Accretion Disk of NGC 5548,” Edelson et al. (50 authors) 2015, ApJ, 806, 129 (14pp) (arXiv:1501.05951)
I contributed comments on the paper text and the interpretation of one of the key results.
- “Space telescope and optical reverberation mapping project. I. ultraviolet observations of the sefert 1 galaxy NGC 5548 with the cosmic origins spectrograph on hubble space telescope,” De Rosa et al. (50 authors) 2015, ApJ, 806, 128 (15pp) (arXiv:1501.05954)
I contributed comments on the paper text and content.
- “The Sloan Digital Sky Survey Reverberation Mapping Project: Rapid C IV Broad Absorption Line Variability,” Grier, **Hall**, Brandt, Trump, Shen, Vivek, Filiz Ak, Chen, Dawson, Denney, Green, Jiang, Kochanek, McGreer, Pâris, Peterson, Schneider, Tao, Wood-Vasey, Bizyaev, Ge, Kinemuchi, Oravetz, Pan, & Simmons 2015, ApJ, 806, 111 (15pp) (arXiv:1503.03076)
I contributed heavily to all aspects of this publication.
- “Mining for Dust in Type 1 Quasars,” Krawczyk, Richards, Gallagher, Leighly, Hewett, Ross, & **Hall** 2015, AJ, 149, 203 (20pp) [Erratum: AJ, 151, 20 (2016)] (arXiv:1412.7039)
I contributed some minor comments to this publication.
- “X-ray insights into the nature of PHL 1811 analogs and weak emission-line quasars: unification with a geometrically thick accretion disk?,” Luo, Brandt, **Hall**, Wu, Anderson, Garmire, Gibson, Plotkin, Richards, Schneider, Shemmer, & Shen 2015, ApJ, 805, 122 (25p) (arXiv:1503.02085)
I contributed heavily to the spectroscopic analysis in this paper and also contributed to the interpretation and discussion of results.
- “Spectroscopic Needs for Imaging Dark Energy Experiments,” Newman et al. (62 additional authors listed alphabetically) 2015, Astroparticle Physics 63, 81-100 [Corrigendum: Astroparticle Physics 65, 112]
I read, commented on, and signed my name to the white paper which became this publication.

- “The Sloan Digital Sky Survey Reverberation Mapping Project: Technical Overview,” Shen, Brandt, Dawson, **Hall**, McGreer, et al. (34 additional authors listed alphabetically) 2015, ApJS, 216:4 (25pp) (arXiv:1408.5970)
I wrote the Canada-France-Hawaii telescope photometry section of this paper, and contributed general comments elsewhere in the paper.
- “The Dependence of C IV Broad Absorption Line Properties on Accompanying Si IV and Al III Absorption: Relating Quasar-Wind Ionization Levels, Kinematics, and Column Densities,” Filiz Ak, Brandt, **Hall**, Schneider, Trump, Anderson, Hamann, Myers, Pâris, Petitjean, Ross, Shen, & York 2014, ApJ, 791, 88 (22pp)
I contributed to the direction of the analysis in this study and to the interpretation of its results.
- “Modeling spikes in quasar accretion disc temperature”, **Hall**, Noordeh, Chajet, Weiss & Nixon 2014, MNRAS, 442, 1090-1109
- “The Sloan Digital Sky Survey quasar catalog: tenth data release”, Pâris, Petitjean, Aubourg, Ross, Myers, Streblyanska, Bailey, **Hall**, Strauss, et al. (41 additional authors listed alphabetically) 2014, A&A, 563, A54 (15pp)
I contributed to the identification of some quasars presented in this study.
- “Simulating the Phases of the Moon Shortly After Its Formation,” Noordeh, **Hall** & Cuk 2014, The Physics Teacher, 52, 239-240
I guided and supervised this work by a summer student of mine.
- “The Naked-eye Optical Transient OT 120926”, Zhao, **Hall**, Delaney & Sandal 2013, JAAVSO, 41, 338-347
I guided and supervised this work by a summer student of mine.
- “The X-ray Spectrum and Spectral Energy Distribution of FIRST J155633.8+351758: a LoBAL Quasar with a Probable Polar Outflow,” Berrington, Brotherton, Gallagher, Ganguly, Shang, DiPompeo, Chatterjee, Lacy, Gregg, **Hall**, & Laurent-Muehleisen 2013, MNRAS, 436, 3321-3330
I contributed to the initial analysis in this study.
- “Broad Absorption Line Variability on Multi-Year Timescales in a Large Quasar Sample,” Filiz Ak, Brandt, **Hall**, Schneider, Anderson, Hamann, Lundgren, Myers, Pâris, Petitjean, Ross, Shen, & York 2013, ApJ, 777, 168 (29pp)
I contributed heavily to the direction of the analysis and to the interpretation of the results.
- “Broad Absorption Line Quasars with Redshifted Troughs: High-Velocity Infall or Rotationally Dominated Outflows?”, **Hall**, Brandt, Petitjean, Pâris, Filiz Ak, Shen, Gibson, Aubourg, Anderson, Schneider, Bizyaev, Brinkmann, Malanushenko, Malanushenko, Myers, Oravetz, Ross, Shelden, Simmons, Streblyanska, Weaver, & York 2013, MNRAS, 434, 222-256
- “Magnetohydrodynamic Disc Winds and Line Width Distributions,” Chajet & **Hall** 2013, MNRAS, 429, 3214-3229
I guided and supervised this work, which was a part of Dr. Chajet’s PhD thesis at York.
- “The Baryon Oscillation Spectroscopic Survey of SDSS-III,” Dawson et al. 2013, AJ, 145, 10 (41pp)

I contributed an ancillary spectroscopic program to the initial phases of the BOSS survey.

- “X-ray and Multiwavelength Insights into the Inner Structure of High-Luminosity Disc-Like Emitters,” Luo, Brandt, Eracleous, Wu, **Hall**, Rafiee, Schneider, & Wu 2013, MNRAS, 429, 1479-1493

I contributed to the target selection for this project and to the interpretation of results.

- “Broad Absorption Line Disappearance on Multi-Year Timescales in a Large Quasar Sample,” Filiz Ak, Brandt, **Hall**, Schneider, Anderson, Gibson, Lundgren, Myers, Petitjean, Ross, Shen, York, Bizyaev, Brinkmann, Malanushenko, Oravetz, Pan, Simmons, & Weaver 2012, ApJ, 757, 114 (19pp)

I contributed to the analysis and interpretation of the results of this study.

- “The Sloan Digital Sky Survey quasar catalog: ninth data release,” Pâris et al. (76 authors) 2012, A&A, 2012, 548, 66 (28pp)

I contributed to the discussion of broad absorption line quasars in this paper.

- “Galaxies with Background QSOs, I: A Search for Strong Galactic H-alpha Lines,” York, Straka, Bishof, Kuttruff, Bowen, Kulkarni, Subbarao, Richards, Vanden Berk, **Hall**, Heckman, Khare, Quashnock, Ghering, & Johnson 2012, MNRAS, 423, 3692-3708

I contributed to the identification of some of the systems used in this study.

- “A Description of Quasar Variability Measured Using Repeated SDSS and POSS Imaging,” MacLeod, Ivezić, Sesar, de Vries, Kochanek, Kelly, Becker, Lupton, **Hall**, Richards, Anderson, & Schneider 2012, ApJ, 753, 106 (21pp) [Erratum: ApJ, 782, 119 (2014)]

I contributed to the interpretation of the results of this study.

- “The Sloan Digital Sky Survey Quasar Lens Search. V. Final Catalog from the Seventh Data Release,” Inada, Oguri, Shin, Kayo, Strauss, Morokuma, Rusu, Fukugita, Kochanek, Richards, Schneider, York, Bahcall, Frieman, **Hall**, White 2012, AJ, 143, 119 (15pp)

I contributed to the identification of the lensed quasars used in this study.

- “Investigating Mg II Absorption in Paired Quasar Sight-Lines,” Rogerson & **Hall** 2012, MNRAS, 421, 971-982

I guided and supervised this work, which is an expanded version of Jesse’s MSc thesis at York.

- “X-ray and Multiwavelength Insights into the Nature of Weak Emission-Line Quasars at Low Redshift,” Wu, Brandt, Anderson, Diamond-Stanic, **Hall**, Plotkin, Schneider, & Shemmer 2012, ApJ, 747:10 (21pp)

I contributed to understanding and interpreting the relationship between X-ray properties of weak-lined quasars and their properties at other wavelengths.

- “Direct Evidence for Termination of Star Formation by Radiatively Driven Outflows in Reddened QSOs,” Farrah, Urrutia, Lacy, Efstathiou, Afonso, Coppin, **Hall**, Lonsdale, Jarrett, Bridge, Borys, & Petty 2012, ApJ, 745:178 (21pp)

I contributed to defining this sample of BAL quasars and to the understanding and interpretation of the results presented herein.

- “C IV Emission and the Ultraviolet through X-ray Spectral Energy Distribution of Radio-Quiet Quasars,” Kruczek, Richards, Gallagher, Deo, **Hall**, Hewett, Leighly, Krawczyk, & Proga 2011, AJ, 142:130 (12pp)
I contributed to understanding and interpretation of the results presented herein.
- “Biases in the Quasar Mass-Luminosity Plane,” Rafiee & **Hall** 2011, MNRAS, 415, 2932-2941
I encouraged Ali to investigate this issue, and wrote the paper jointly with him.
- “A Population of X-ray Weak Quasars: PHL 1811 Analogs at High Redshift,” Wu, Brandt, **Hall**, Gibson, Richards, Schneider, Shemmer, Just, & Schmidt 2011, ApJ, 736:28 (21pp)
I was responsible for identifying the sample of targets for X-ray investigation and measuring their properties. I also contributed to the interpretation of the results and came up with our unification scenario.
- “A Catalog of Quasar Properties from Sloan Digital Sky Survey Data Release 7,” Shen, Richards, Strauss, **Hall**, Schneider, Snedden, Bizyaev, Brewington, Malanushenko, Malanushenko, Oravetz, Pan, & Simmons 2011, ApJS, 194:45 (21pp)
I contributed to understanding and interpretation of the results presented herein.
- “Supermassive Black Hole Mass Estimates Using Sloan Digital Sky Survey Quasar Spectra at $0.7 < z < 2$,” Rafiee & **Hall** 2011, ApJS, 194:42 (15pp)
This is the main paper from Dr. Rafiee’s PhD thesis at York, which I supervised.
- “Unification of Luminous Type 1 Quasars through C IV Emission,” Richards, Kruczek, Gallagher, **Hall**, Hewett, Leighly, Deo, Kratzer, & Shen 2011, AJ, 141:167 (16pp)
I contributed to understanding and interpretation of the results presented herein.
- “**Implications of Dramatic Broad Absorption Line Variability in the Quasar FBQS J1408+3054**,” **Hall**, Anosov, White, Brandt, Gregg, Gibson, Becker & Schneider 2011, MNRAS, 411, 2653-2666
- “The Extremely High-Velocity Outflow in Quasar PG0935+417,” Rodríguez Hidalgo, Hamann & **Hall** 2011, MNRAS, 411, 247-259
I provided suggestions on the manuscript and the analysis (which were implemented).
- “Chandra X-ray Observations of Two Unusual BAL Quasars,” Rogerson, **Hall**, Snedden, Brotherton & Anderson 2011, New Astronomy, 16, 128-137
I began this work and oversaw its completion by my Master’s student J. Rogerson.
- “The Sloan Digital Sky Survey Quasar Lens Search IV. Statistical Lens Sample from the Fifth Data Release,” Inada, Oguri, Shin, Kayo, Strauss, Hennawi, Morokuma, Becker, White, Kochanek, Gregg, Chiu, Johnston, Clocchiatti, Richards, Schneider, Frieman, Fukugita, Gott, **Hall**, York, Castander, & Bahcall 2010, AJ, 140, 403-415
I contributed to the identification of the lensed quasars used in this study.
- “SDSS J094604.90+183541.8: A Gravitationally Lensed Quasar at $z=4.8$,” McGreer, **Hall**, Fan, Bian, Inada, Oguri, Strauss, Schneider, & Farnsworth 2010, AJ, 140, 370-378
I discovered this gravitational lens in the SDSS spectral database and contributed to the followup effort to study its properties.

- “The Sloan Digital Sky Survey Quasar Catalog V. Seventh Data Release,” Schneider, Richards, **Hall** et al. (48 authors) 2010, AJ, 139, 2360-2373
I contributed to the detailed evaluation of thousands of SDSS spectra needed to achieve high completeness and low contamination in this sample.
- “Eight New Quasar Lenses from the Sloan Digital Sky Survey Quasar Lens Search,” Kayo, Inada, Oguri, Morokuma, **Hall**, Kochanek & Schneider 2010, AJ, 139, 1614-1621
I contributed the measurement of absorption-line properties of several newly discovered lenses.
- “Detecting active comets in the SDSS,” Solontoi, Ivezić, West, Claire, Jurić, Becker, Jones, **Hall**, Kent, Lupton, Knapp, Quinn, Gunn, Schneider, & Loomis 2010, Icarus, 205, 605-618
Using the SDSS database, I recovered several known comets, reported in this paper.
- “Optically Selected BL Lacertae Candidates from the Sloan Digital Sky Survey Data Release Seven,” Plotkin, Anderson, Brandt, Diamond-Stanic, Fan, **Hall**, Kimball, Richmond, Schneider, Shemmer, Voges, York, Bahcall, Snedden, Bizyaev, Brewington, Malanushenko, Malanushenko, Oravetz, Pan, & Simmons 2010, AJ, 139, 390-414
I contributed to the identification of unusual quasars.
- “A Public, K-Selected, Optical-to-Near-Infrared Catalog of the Extended Chandra Deep Field South (ECDFS) from the Multiwavelength Survey by Yale-Chile (MUSYC),” Taylor, Franx, van Dokkum, Quadri, Gawiser, Bell, Barrientos, Blanc, Castander, Damen, Gonzalez-Perez, **Hall**, Herrera, Hildebrandt, Kriek, Labbé, Lira, Maza, Rudnick, Treister, Urry, Willis, & Wuyts 2009, ApJS, 183, 295-319
I participated in planning and obtaining the near-infrared imaging component of MUSYC.
- “The Seventh Data Release of the Sloan Digital Sky Survey,” Abazajian et al. 2009 (204 authors listed alphabetically), ApJS, 182, 543-558
I contributed to the inspection of SDSS spectra for quasars, white dwarfs, and unusual objects.
- “Quasar Clustering from SDSS DR5: Dependences on Physical Properties,” Shen, Strauss, Ross, **Hall**, Lin, Richards, Schneider, Weinberg, Connolly, Fan, Hennawi, Shankar, Vanden Berk, Bahcall, & Brunner 2009, ApJ, 697, 1656-1673
I contributed to the analysis and interpretation of the observations.
- “Clustering of Low-Redshift ($z \leq 2.2$) Quasars from the Sloan Digital Sky Survey,” Ross, Shen, Strauss, Vanden Berk, Connolly, Richards, Schneider, Weinberg, **Hall**, Bahcall, & Brunner 2009, ApJ, 697, 1634-1655
I contributed to the analysis and interpretation of the observations.
- “GRB 080503: Implications of a Naked Short Gamma-Ray Burst Dominated by Extended Emission,” Perley, Metzger, Granot, Butler, Sakamoto, Ramirez-Ruiz, Levan, Bloom, Miller, Bunker, Chen, Filippenko, Gehrels, Glazebrook, **Hall**, Hurley, Kocevski, Li, Lopez, Norris, Piro, Poznanski, Prochaska, Quataert, & Tanvir 2009, ApJ, 696, 1871-1885
I contributed to the analysis and interpretation of the observations.
- “A Catalog of Broad Absorption Line Quasars in the Sloan Digital Sky Survey Data Release 5,” Gibson, Jiang, Brandt, **Hall**, Shen, Wu, Anderson, Schneider, Vanden Berk, Gallagher, Fan & York 2009, ApJ, 692, 758-777

I helped test and implement the absorption line detection algorithm, extracted the data on multiple observations of some objects, provided the catalog of FeLoBALs and other objects with complex absorption, and contributed to the scientific analysis.

- “Observations of the Naked-Eye GRB 080319B: Implications of Nature’s Brightest Explosion,” Bloom, Perley, Li, Butler, Miller, Kocevski, Kann, Foley, Chen, Filippenko, Starr, Macomber, Prochaska, Chornock, Poznanski, Klose, Skrutskie, Lopez, **Hall** & Blake 2009, ApJ, 691, 723-737
I contributed to the analysis and interpretation of the observations.
- “Rapidly Spinning Black Holes: An Open Question,” Rafiee & **Hall** 2009, ApJ, 691, 425-430
I found an error in a 2006 publication on this topic and advised my PhD student Ali Rafiee in correcting the analysis and exploring the implications for the average spin of black holes.
- “Constraining the quasar population with the broad-line width distribution,” Fine, Croom, Hopkins, Hernquist, Bland-Hawthorn, Colless, **Hall**, Miller, Myers, Nichol, Pimblet, Ross, Schneider, Shanks & Sharp 2008, MNRAS, 390, 1413-1429
I independently verified an analysis which was key to interpreting these results.
- “Multiwavelength Survey by Yale-Chile (MUSYC): Wide K-band Imaging, Photometric Catalogs, Clustering and Physical Properties of Galaxies at $z \sim 2$,” Blanc, Lira, Barrientos, Aguirre, Francke, Taylor, Quadri, Marchesini, Infante, Gawiser, **Hall**, Willis, Herrera & Maza 2008, ApJ, 681, 1099-1115.
I participated in planning and obtaining the near-infrared imaging component of MUSYC.
- “Narrow associated QSO absorbers: clustering, outflows and the line-of-sight proximity effect,” Wild, Kauffmann, White, York, Lehnert, Heckman, **Hall**, Khare, Lundgren, Schneider & Vanden Berk 2008, MNRAS, 388, 227-241
I contributed to the analysis and interpretation of the observations.
- “A Nearby Old Halo White Dwarf Candidate from the Sloan Digital Sky Survey,” **Hall**, Kowalski, Harris, Awal, Leggett, Kilic, Anderson & Gates 2008, AJ, 136, 76-82; featured in a York University press release available at the YSSSTP website <http://www.ysimste.ca/projects/yssstp.html>
- “A Large Sample of BL Lac Objects from the SDSS and FIRST,” Plotkin, Anderson, **Hall**, Margon, Voges, Schneider, Stinson & York 2008, AJ, 135, 2453-2469
I contributed to the identification of candidate BL Lac objects from SDSS spectra.
- “Additional Ultracool White Dwarfs Found in the Sloan Digital Sky Survey,” Harris, Gates, Gyuk, SubbaRao, Anderson, **Hall**, Munn, Liebert, Knapp, Bizyaev, Malanushenko, Malanushenko, Pan, Schneider & Smith 2008, ApJ, 679, 697-703
I contributed to the identification of ultracool white dwarfs from SDSS spectra.
- “Average Properties of a Large Sample of $z(\text{abs}) \sim z(\text{em})$ Mg II Absorption Line Systems,” Vanden Berk, Khare, York, Richards, Lundgren, Alsayyad, Kulkarni, SubbaRao, Schneider, Heckman, Anderson, Crotts, Frieman, Stoughton, Lauroesch, **Hall**, Meiksin, Steffing & Vanlandingham 2008, ApJ, 679, 239-259
I contributed to the analysis and interpretation of the observations, particularly with regard to the excess reddening found in quasars detected at radio wavelengths.

- “**C₂ in Peculiar DQ White Dwarfs,**” **Hall** & Maxwell 2008, ApJ, 678, 1292-1297
- “Quasar Clustering at 25kpc/h from a Complete Sample of Binaries,” Myers, Richards, Brunner, Schneider, Strand, **Hall**, Blomquist & York 2008, ApJ, 635-646
I contributed to the identification of quasars from SDSS spectra.
- “Do Broad Absorption Line Quasars Live in Different Environments from Ordinary Quasars?,” Shen, Strauss, **Hall**, Schneider, York & Bahcall 2008, ApJ, 677, 858-862
I contributed to the construction of the BAL quasar sample used in this project.
- “The Sixth Data Release of the Sloan Digital Sky Survey,” Adelman-McCarthy et al. 2008, ApJS, 175, 297-313
I contributed to the inspection of SDSS spectra for quasars, white dwarfs, and unusual objects.
- “The Black Hole-Bulge Relationship in Luminous Broad-Line Active Galactic Nuclei and Host Galaxies,” Shen, Vanden Berk, Schneider & **Hall** 2008, AJ, 135, 928-946
I contributed heavily to the analysis and interpretation in this paper, in particular by running a partial correlation analysis to help determine relationships between key parameters.
- “The Sloan Digital Sky Survey Quasar Lens Search. II. Statistical Lens Sample from the Third Data Release,” Inada, Oguri, Becker, Shin, Richards, Hennawi, White, Pindor, Strauss, Kochanek, Johnston, Gregg, Kayo, Eisenstein, **Hall** et al. 2008, AJ, 135, 496-511
I contributed to assembling the SDSS quasar sample used for this project.
- “The Sloan Digital Sky Survey Quasar Lens Search. III. Constraints on Dark Energy from the Third Data Release Quasar Lens Catalog,” Oguri, Inada, Strauss, Kochanek, Richards, Schneider, Becker, Fukugita, Gregg, **Hall** et al. 2008, AJ, 135, 512-519
I contributed to assembling the SDSS quasar sample used for this project.
- “On the Spectral Evolution of Cool, Helium-Atmosphere White Dwarfs: Detailed Spectroscopic and Photometric Analysis of DZ Stars,” Dufour, Bergeron, Liebert, Harris, Knapp, **Hall**, Strauss, Collinge & Edwards 2007, ApJ, 663, 1291-1308
I contributed to assembling the white dwarf sample used for this project.
- “The Fifth Data Release of the Sloan Digital Sky Survey,” Adelman-McCarthy et al. 2007, ApJS, 172, 634-644
I contributed to the inspection of SDSS spectra for quasars, white dwarfs, and unusual objects.
- “A New Quadruply Lensed Quasar: SDSS J125107.57+293540.5,” Kayo, Inada, Oguri, **Hall**, Kochanek, Richards, Schneider, York & Pan 2007, AJ, 134, 1515-1521
I contributed to assembling the SDSS quasar sample used for this paper, streamlined the discussion in it, and helped create a figure to illustrate a key result.
- “**Acceleration and Substructure Constraints in a Quasar Outflow,**” **Hall**, Sadavoy, Hutsemékers, Everett & Rafiee 2007, ApJ, 665, 174-186
- “The Multiwavelength Survey by Yale-Chile (MUSYC): Deep Near-Infrared Imaging and the Selection of Distant Galaxies,” Quadri, Marchesini, van Dokkum, Gawiser, Franx, Lira, Rudnick, Urry, Maza, Kriek, Barrientos, Blanc, Castander, Christlein, Coppi, **Hall**, Herrera, Infante, Taylor, Treister & Willis 2007, AJ, 134, 1103-1117
I participated in planning and obtaining the near-infrared imaging component of MUSYC.

- “Near-Infrared Properties of Moderate-Redshift Galaxy Clusters: Halo Occupation Number, Mass-to-Light Ratios and Ω_M ,” Muzzin, A., Yee, H. K. C., **Hall**, P. B., and Lin, H., 2007, ApJ, 663, 150-163
I helped plan and obtain the near-infrared images used in this project and developed custom reduction software to mosaic them together and provide images for analysis.
- “The Sloan Digital Sky Survey Quasar Catalog. IV. Fifth Data Release,” Schneider, **Hall** et al. 2007, AJ, 134, 102-117
I contributed greatly to the detailed evaluation of thousands of SDSS spectra needed to achieve high completeness and low contamination in this sample.
- “A Systematic Search for High Surface Brightness Giant Arcs in a Sloan Digital Sky Survey Cluster Sample, Estrada, Annis, Diehl, **Hall**, Las, Lin, Makler, Merritt, Scarpine, Allam & Tucker 2007, ApJ, 660, 1176-1185
I discovered a gravitationally lensed arc discussed in this paper.
- “Near-Infrared Properties of Moderate-Redshift Galaxy Clusters: Luminosity Functions and Density Profiles,” Muzzin, A., Yee, H. K. C., **Hall**, P. B., Ellingson, E., and Lin, H., 2007, ApJ, 659, 1106-1124
I helped plan and obtain the near-infrared images used in this project and developed custom reduction software to mosaic them together and provide images for analysis.
- “Clustering of High Redshift ($z > 2.9$) Quasars from the Sloan Digital Sky Survey,” Shen, Strauss, Oguri, Hennawi, Fan, Richards, **Hall**, Gunn, Schneider, Szalay, Thakar, Vanden Berk, Anderson, Bahcall, Connolly & Knapp 2007, AJ, 133, 2222-2241
I contributed to assembling the SDSS quasar sample used for this project.
- “The UV Properties of SDSS-Selected Quasars,” Trammell, Vanden Berk, Schneider, Richards, **Hall**, Anderson & Brinkmann 2007, AJ, 133, 1780-1794
I contributed to assembling the SDSS quasar sample used for this project.
- “A Quasar with Broad Absorption in the Balmer Lines,” **Hall, P. B.**, 2007, AJ, 133, 1271-1274
- “Broad Absorption Line Variability in Repeat Quasar Observations from the Sloan Digital Sky Survey,” Lundgren, Wilhite, Brunner, **Hall**, Schneider, York, Vanden Berk & Brinkmann 2007, ApJ, 656, 73-83
I contributed to the construction of the BAL quasar sample used in this project and to the analysis and interpretation of the observations.
- “Cosmological Constraints from the Red-Sequence Cluster Survey,” Gladders, Yee, Majumdar, Barrientos, Hoekstra, **Hall** & Infante 2007, ApJ, 655, 128-134
I participated in planning and obtaining the imaging data used for this project.
- “Hubble Space Telescope Ultraviolet Spectroscopy of Fourteen Low-Redshift Quasars,” Ganguly et al. 2007, AJ, 133, 479-486
I was a co-investigator who contributed to the proposal for this project.
- “A Large, Uniform Sample of X-ray Emitting AGN from the ROSAT All-Sky and Sloan Digital Sky Surveys: the Data Release 5 Sample,” Anderson et al. 2007, AJ, 133, 313-329

I contributed to assembling the SDSS quasar sample used for this project.

- “Discovery of a Gravitationally Lensed Quasar from the Sloan Digital Sky Survey: SDSS J133222.62+034739.9,” Morokuma, Inada, Oguri, Ichikawa, Kawano, Tokita, Kayo, **Hall**, Kochanek, Richards, York & Schneider 2007, AJ, 133, 214-219
I contributed to assembling the SDSS quasar sample used for this project, and to streamlining the discussion in this paper.
- “Two New Gravitationally Lensed Double Quasars from the Sloan Digital Sky Survey,” Inada, Oguri, Becker, White, Kayo, Kochanek, **Hall**, Schneider, York & Richards 2007, AJ, 133, 206-213
I contributed to assembling the SDSS quasar sample used for this project, and identified an unusual intervening absorption system in one of the lenses.
- “Chandra Observations of Red Sloan Digital Sky Survey Quasars,” **Hall**, Gallagher, Richards, Alexander, Anderson, Bauer, Brandt & Schneider 2006, AJ, 132, 1977-1988
- “Spectral Energy Distributions and Multiwavelength Selection of Type 1 Quasars,” Richards, Lacy, Storrie-Lombardi, **Hall**, Gallagher, Hines, Fan, Papovich, Vanden Berk, Trammell, Schneider, Vestergaard, York, Jester, Anderson, Budavari & Szalay 2006b, ApJS, 166, 470-497
I contributed to assembling the SDSS quasar sample used for this project and provided some additional photometry.
- “Chandra Observations of SDSS J1004+4112: Constraints on the Lensing Cluster and Anomalous X-Ray Flux Ratios of the Quadruply Imaged Quasar,” Ota, Inada, Oguri, Mitsuda, Richards, Suto, Brandt, Castander, Fujimoto, **Hall**, Keeton, Nichol, Schneider, Eisenstein, Frieman, Turner, Minezaki & Yoshii 2006, ApJ, 647, 215-221
I was a co-investigator who contributed to the proposal for this project.
- “A Catalog of Broad Absorption Line Quasars from the Sloan Digital Sky Survey Third Data Release,” Trump, J. R., **Hall, P. B.**, Reichard, Richards, Schneider, Vanden Berk, Knapp, Anderson, Fan, Brinkmann, Kleinman & Nitta 2006, ApJS, 165, 1-18 [cited in *Astrophysics in 2006*, Trimble et al. astro-ph/0705.1730]
I contributed heavily to improving the semi-automated identification of BAL quasars and to the measurement, analysis and interpretation of their absorption properties.
- “Variable Faint Optical Sources Discovered by Comparing POSS and SDSS Catalogs,” Sesar, Svilkovic, Ivezić, Lupton, Munn, Finkbeiner, Steinhardt, Siverd, Johnston, Knapp, Gunn, Rockosi, Schlegel, Vanden Berk, **Hall**, Schneider & Brunner 2006, AJ, 131, 2801-2825
I contributed to assembling the SDSS quasar sample used for this project.
- “The SDSS Quasar Survey: Quasar Luminosity Function from Data Release Three,” Richards, G. T., Strauss, M. A., Fan, X., **Hall, P. B.**, Jester, Schneider, Vanden Berk, Stoughton, Anderson, Brunner, Gray, Gunn, Ivezić, Kirkland, Knapp, Loveday, Meiksin, Pope, Szalay, Thakar, Yanny & York 2006a, AJ, 131, 2766-2787
I contributed to assembling the SDSS quasar sample used for this project.
- “Average Extinction Curves and Relative Abundances for QSO Absorption Line Systems at $1 < z < 2$,” York, Khare, Vanden Berk, Kulkarni, Crotts, Lauroesch, Richards, Schneider, Welty,

Alsayyad, Kumar, Lundgren, Shanidze, Smith, Vanlandingham, Baugher, **Hall**, Jenkins, Menard, Rao, Tumlinson, Turnshek, Yip & Brinkmann 2006, MNRAS, 367, 945-978

I contributed to assembling the SDSS quasar sample used for this project, and to the interpretation of reddenings estimated for various subsamples.

- “The Fourth Data Release of the Sloan Digital Sky Survey,” Adelman-McCarthy, J., et al. 2006, ApJS, 162, 38-48
I contributed to the inspection of SDSS spectra for quasars, white dwarfs, and unusual objects.
- “Spectral Decomposition of Broad-Line AGNs and Host Galaxies,” Vanden Berk, Shen, Yip, Schneider, Connolly, Burton, Jester, **Hall**, Szalay & Brinkmann 2006, AJ, 131, 84-99
I contributed to assembling the quasar sample used herein, and to the interpretation of the results.
- “SDSS J102111.02+491330.4: A Newly Discovered Gravitationally Lensed Quasar,” Pindor, Eisenstein, Gregg, Becker, Inada, Oguri, **Hall**, Johnston, Richards, Schneider, Turner, Brasi, Hinz, Kenworthy, Miller, Barentine, Brewington, Brinkmann, Harvanek, Kleinman, Krzesinski, Long, Neilsen Jr., Newman, Nitta, Snedden & York 2006, AJ, 131, 41-48
I investigated and ruled out numerous gravitational lens candidates; the null results of that search were published herein.
- “Binary Quasars in the Sloan Digital Sky Survey: Evidence for Excess Clustering on Small Scales,” Hennawi, Strauss, Oguri, Inada, Richards, Pindor, Schneider, Becker, Gregg, **Hall**, Johnston, Fan, Burles, Schlegel, Gunn, Lupton, Bahcall, Brunner & Brinkmann 2006, AJ, 131, 1-23
Some of the gravitational lens candidates I investigated turned out to be binary quasars useful for this project.
- “Ultracompact AM CVn Binaries from the Sloan Digital Sky Survey: Three Candidates Plus the First Confirmed Eclipsing System,” Anderson, S. F., et al. 2005, AJ, 130, 2230-2236
I contributed to identifying some of the unusual binary stars discussed in this paper.
- “SDSS J024634.11-082536.2: A New Gravitationally Lensed Quasar from the Sloan Digital Sky Survey,” Inada, Burles, Gregg, Becker, Schechter, Eisenstein, Oguri, Castander, **Hall**, Johnston, Pindor, Richards, Schneider, White, Brinkmann, Szalay & York 2005, AJ, 130, 1967-1976
I contributed to assembling the SDSS quasar sample used for this project.
- “The Optical-Infrared Colors of CORALS QSOs: Searching for Dust Reddening Associated with High-Redshift Damped Ly α Systems,” Ellison, S. L., **Hall, P. B.**, & Lira, P. 2005, AJ, 130, 1345-1357
I contributed heavily to the analysis and interpretation in this paper.
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Abstracts and Other Unrefereed Contributions

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- “The Detailed Science Case for the Maunakea Spectroscopic Explorer, 2019 edition” The MSE Science Team: Babusiaux et al. 2019 (263 authors), (arXiv:1904.04907)
- Astro2020 Science White Paper “Mapping the Inner Structure of Quasars with Time-Domain Spectroscopy,” Shen, et al. 2019 (43 authors), (arXiv:1903.04533)
- “Investigations of transforming BAL quasars,” Sameer, Brandt, **Hall**, Anderson, Mariappan, Filiz Ak, Grier, Ahmed, Luo, Myers, Rodríguez Hidalgo, Ruan, & Schneider 2019, AAS meeting 233, #242.07
- “Extremely High Velocity Outflows in Quasars,” Rodríguez Hidalgo, Haas, Khatri, **Hall**, Quintero, Khatu, & Murray 2019, AAS meeting 233, #213.05
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- “Optimal scheduling and science delivery of spectra for millions of targets in thousands of fields: the operational concept of the Maunakea spectroscopic explorer (MSE),” Flagey, McConnachie, Szeto, **Hall**, Hill, & Hervieu 2018, Proc. SPIE, 107040V (2018) (arXiv:1807.08019)
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- “Broad Absorption Line Variability on Multi-Year Timescales in a Large Quasar Sample,” Brandt, Filiz Ak, **Hall** et al. 2014, AAS meeting 223, #126.01
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- “Spectroscopic Needs for Imaging Dark Energy Experiments: Photometric Redshift Training and Calibration,” Newman et al. 2013, Snowmass white paper (arXiv:1309.5384)

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- “Investigating MgII Absorption in Paired Quasar Sight-Lines,” Rogerson & **Hall** 2011, Canadian Astronomy Society annual meeting 2011, #8S (awarded runner-up prize for 2nd best student poster at the meeting)
- “Near-IR through UV SEDs and Dust Reddening in SDSS Quasars,” Krawczyk et al. 2010, AAS meeting 215, #433.18
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- “Keeping a Lensed Eye on the Intergalactic Medium,” Rogerson, **Hall**, Allam, Lin & Tucker 2009, Canadian Astronomy Society annual meeting 2009, #P123
- “Implications for the Number Density of Quasars at $z > 4.8$ Using VIZJ Imaging from the BTC40 Multicolor Survey,” Bursick et al. 2008, AAS meeting 213, #447.08
- “Mining the Unknown in the Sloan Digital Sky Survey,” **Hall** 2008, oral presentation at the Royal Astronomical Society of Canada annual general assembly, June 2008; featured in a York University press release: <http://www.yorku.ca/mediar/archive/Release.asp?Release=1468> and in Y-File June 30, 2008: <http://www.yorku.ca/yfile/archive/index.asp?Article=10758>
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- “Improving Black Hole Mass Estimates,” Rafiee, A. and **Hall**, P. B. 2008, Canadian Astronomy Society annual meeting 2008, #P114
- “The X-ray Spectrum and Spectral Energy Distribution of FIRST J155633.8+351758: A Beamed Radio-Quiet Quasar with a Polar Outflow,” Berrington et al. 2008, AAS meeting 211, #64.05

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- “Education and Science with Transiting Exoplanets,” Delaney, P., **Hall**, P. B., Maxwell, A., Sadavoy, S., Ward, R., Hsu, S., 2007, Canadian Astronomy Society annual meeting 2007, #P20
- “IR confirmation of $z > 5.5$ Quasar Candidates,” Chajet, L., **Hall**, P., Ward, R., et al. 2007, Canadian Astronomy Society annual meeting 2007, #P12
- “Broad Intrinsic Absorption in Sloan Digital Sky Survey Quasars,” **Hall**, P. B., et al. 2006, AAS meeting 208, #52.09
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- “DQ White Dwarfs in the Sloan Digital Sky Survey,” Halford, K., et al. 2005, AAS meeting 207, #131.02
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- “The SDSS view of the Palomar-Green Bright Quasar Survey,” Jester, S. et al. 2004, AAS meeting 205, #143.17

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- “X-ray Constraints on CIV Blueshift as an Orientation Indicator for Radio-Quiet Quasars,” Gallagher, S. C. et al. 2004, HEAD meeting 8, #26.03
- “Near-IR Selected Quasars in the NDWFS Bootes Field,” Green, R. F. et al. 2004, AAS meeting 204, #48.16
- “Broad Absorption Line Quasars from the Sloan Digital Sky Survey Second Data Release,” Trump, J. R., **Hall**, P. B. et al. 2004, AAS meeting 203, #78.07
- “Serendipitous Discovery of the 2175 Angstrom Dust Feature at High Redshift from the Sloan Digital Sky Survey,” Wang, J., **Hall**, P. B., Ge, J., et al. 2004, AAS meeting 203, #113.05
- “Broad Absorption Line Quasars from the Sloan Digital Sky Survey Second Data Release,” Trump, J. R., **Hall**, P. B., et al. 2004, AAS meeting 203, #78.07
- “Correlation of SDSS Quasar Properties with Eigenvector Trends,” Richards, G. T., **Hall**, P. B., Vanden Berk, D. E., Schneider, D. P., Strauss, M. A. & Fan, X. 2002, BAAS 34, 1309
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- “A Population of Type II Quasars in the Sloan Digital Sky Survey,” Zakamska, N. L. et al. 2002, BAAS 34, 1289
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- “High-Redshift and Strong-Lensing Clusters from the RCS,” Gladders, M. D. et al. 2002, BAAS 34, 1209
- “Cataclysmic variables from the Sloan Digital Sky Survey Data Release 1,” Walkowicz et al. 2002, BAAS 34, 1125
- “First Results from the Gemini-South/FLAMINGOS Demonstration Science Program,” Stern et al. 2002, BAAS 34, 1098
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- “The BTC40 Survey for $5 < z < 6$ Quasars,” Monier, E., Osmer, P., Kennefick, J., **Hall**, P. B., Smith, M. & Green, R. 2002, BAAS 33, 1515
- “Studying AGN with SNAP,” Osmer, P. S. & **Hall**, P. B. 2002, BAAS 33, 1476
- “Unusual BAL Quasars from the SDSS,” **Hall**, P. B. et al. 2002, BAAS 33, 1457
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- “The 2MASS Sky at High Galactic Latitudes,” Knapp, G. R. et al. 2001, BAAS 33, 829

- “Serendipitous Emission Lines in the Sloan Digital Sky Survey,” Burles, S., Eisenstein, D., **Hall**, P. B., Schlegel, D., & SDSS Collaboration 2001, BAAS 32, 1423
- “Optical and Infrared Properties of Sources Observed by the Two Micron All Sky Survey and the Sloan Digital Sky Survey,” Ivezić, Ž. & SDSS Collaboration 2001, BAAS 32, 1422
- “Application of CNOC2-Calibrated Photometric Redshifts to Measuring Galaxy Evolution,” Lin, H., Sawicki, M., Yee, H.K.C., & **Hall**, P. B. 2000, BAAS 32, 764
- “An Efficient Survey for L Dwarfs, T Dwarfs, and $z > 5.5$ Quasars,” **Hall**, P. B., Gladders, M.D., Barrientos, F., Yee, H.K.C., & Sawicki, M. 2000, BAAS 196, 678
- “AGN from the CNOC2 Field Galaxy Redshift Survey,” **Hall**, P. B., Yee, H.K.C., Lin, H., Morris, S.L., Patton, D.R., Sawicki, M., Shepherd, C.W., Wirth, G.D., Carlberg, R., Bechtold, J., & Elston, R. 1999, BAAS 195, 1544
- “Quasar Candidates in the Hubble Deep Field South,” Monier, E., Conti, A., Osmer, P., Kenefick, J., **Hall**, P. B., & Smith, M. 1999, BAAS 195, 1398
- “Multi-Epoch Multiwaveband Spectra of 3C279,” Hartman, R.C., *et al.* 1999, BAAS 195, 1395
- “Properties of Candidate Cluster Galaxies at $z > 1$,” **Hall**, P. B. 1998, talk presented at the 13th Kingston Meeting on Theoretical Astrophysics: Galaxy Formation and Cosmic Star Formation History
- IAUC 6869 & 6870, 1998 April 7, recovery of Uranian moons S/1997 U 1 (Caliban) and S/1997 U 2 (Sycorax)
- IAUC 6852, 1998 March 28, optical counterpart of GRB 980326. Using the BTC on the CTIO 4-meter telescope with M. Smith (CTIO), I was part of the “large collaboration” which identified the optical counterpart of GRB 980326.
- “Big Faint Quasar Survey,” **Hall**, P. B., Kenefick, J., Green, R. F., Osmer, P. S., & Smith, M. G. 1998, BAAS 191, 768.
- “Candidate High Redshift Clusters Around Radio Loud Quasars,” **Hall**, P. B. & Green, R. 1996, BAAS 28, 1287
- “The Environments of Radio-Loud Quasars from $z=0.6$ to $z=2.0$,” **Hall**, P. B. & Green, R. F. 1995, BAAS 27, 1414
- “Observations of the Gravitational Lens System IRAS FSC 10214+4724,” **Hall**, P. B., Close, L. M., Liu, C. T., & Hege, E. K. 1995, BAAS 27, 1212
- “Radio-Loud Quasar Environments from $z=0.6$ to $z=2.0$,” **Hall**, P. B. & Green, R. 1994, BAAS 26, 1504
- “A ROSAT Search for X-ray Emission from Quasar Host Clusters,” **Hall**, P. B., Ellingson, E., Green, R. F., & Yee, H. K. C. 1994, BAAS 26, 960
- “First Results of A Deep Multicolor Survey For Quasars,” **Hall**, P. B., Osmer, P. S., Green, R. F., Porter, A. C., & Warren, S. J. 1992, BAAS 24, 1136

- “A Spectrophotometric Study of Merging Galaxies,” Liu, C. T., Kennicutt, R. C., Jr., & **Hall**, P. B. 1992, BAAS 24, 1181
- “Optical polarimetry & photometry of PKS 2155-304 during the November 1991 IUE monitoring campaign,” Smith, P. S., Allen, R. G., **Hall**, P. B., and Sitko, M. L. 1992, BAAS 24, 691
- “Faculty-Student Relationships: A Video Perspective,” The Steward Observatory Not Ready for Dark Time Players, 1991, BAAS 23, 1438

Other

- Two activities provided for *Astronomy In-Class Activities: Custom Edition for York University*, 2009, Pearson Custom Publishing

Papers by Research Group Members

- “The COS/UVES Absorption Survey of the Magellanic Stream. III. Ionization, Total Mass, and Inflow Rate onto the Milky Way,” Fox et al. (including Rodríguez Hidalgo) 2014, ApJ, 787, 147
- “Extreme-Velocity Quasar Outflows and the Role of X-ray Shielding,” Hamann, Chartas, McGraw, Rodríguez Hidalgo, Shields, Capellupo, Charlton, & Eracleous 2013, MNRAS, 435, 133
- “Discovery of the Transition of a Mini-broad Absorption Line into a Broad Absorption Line in the SDSS Quasar J115122.14+020426.3,” Rodríguez Hidalgo, Eracleous, Charlton, Hamann, Murphy, & Nestor 2013, ApJ, 775, 14
- “Evolution of the population of very strong Mg II absorbers,” Rodríguez Hidalgo, Wessels, Charlton, Narayanan, Mshar, Cucchiara, & Jones 2012, MNRAS, 427, 1801

Public Outreach, Education, and Media Coverage

- Public Talk to University of Toronto Astronomy and Space Exploration club: 'Quasars: Black Holes You Can "See"', October 24, 2018
- Public Talk for Science Literacy Week at York University 'Our Weird Universe!', September 19, 2018
- Public Talk to RASC Victoria Centre 'Quasars: Black Holes You Can "See"', January 10, 2018
- Public Talk 'Quasar, Quasar, Burning Bright' (Chronicles of a Peculiar Universe #1) at Toronto Public Library Coxwell Branch, October 11, 2017
- Public Talk on 'Gas Falling into Black Holes: A Surprising Discovery' at a Dominion Astrophysical Observatory Summer Star Party evening, August 26, 2017
- Performer at Science Slam for Science Rendezvous After Dark: Hard-Boiled Astronomy, May 13, 2017
- In Search Of... Planet Nine public talk to York University Astronomy Club, Mar. 22, 2017
- Actor, Dark Energy Infomercial parody at .Astronomy 2016 conference
- Nucleosynthesis - The Musical! public talk to York University Astronomy Club, Mar. 23, 2016
- Press release on ultra-fast winds near supermassive black holes, reporting the discovery of record high-speed UV absorption in collaboration with my grad student Jesse Rogerson, March 21, 2016
- Subject of 'Galactic Appetite' profile on discovery of quasars with gas apparently falling into black holes in the View section of The York University Magazine, Fall 2015
- Public Q&A Session (with Prof. John Moores) at York University Astronomy Club event 'Plutopalooza' celebrating the New Horizons mission flyby of Pluto, July 14, 2015
- Consulted for New model of sun's cycles predicts 'mini ice age' in 2030s CTV News online news story, July 13, 2015
- Nucleosynthesis public talk to York University Astronomy Club, Jan. 28, 2015
- Talk on 'State of the Universe 2014' at Science Teachers' Association of Ontario (STAO) annual conference, Nov. 15, 2014
- Developer and Co-Instructor, Helix Summer Science Institute senior high school student course *Our Weird Universe*, July 14-18, 2014
- Talk on 'Gas Falling Into Black Holes: A Surprising Discovery' to the Royal Astronomical Society of Canada, Mississauga Centre, May 23, 2014
- 'Imagine Relativity' talk at TEDx St. Mary's Catholic Secondary School, May 8, 2014
- 'Our Weird Universe' talks to two groups of 9th grade students, May 5, 2014
- Skype interview by 1st and 2nd grade students at Edgewood P.S., Apr. 24, 2014

- Featured in the Faculty of Science Annual Report 2013
- Redshifted BAL Quasars public talk to York University Astronomy Club, Oct. 16, 2013
- Monthly guest on York's Astronomy.fm internet radio show *YorkUniverse!*, September 2012 - March 2015
- Guest on The Star Spot astronomy podcast, September 2012 (<http://starspotpodcast.com>)
- Interviewed on York's Astronomy.fm internet radio show *YorkUniverse!*, July 2012
- Coordinator, Physics & Astronomy Department website revamp, Sep. 2011 - June 2012
- Talk on quasars to the Royal Astronomical Society of Canada, Toronto Centre, April 2012
- Departmental representative at York's March Gala, Mar. 31, 2012
- Guest on University of Cambridge Institute of Astronomy podcast *Astropod*, February 2011 (<http://www.ast.cam.ac.uk/astropod/>)
- Guest on astronomy Q&A show *Live from York U!* on Astronomy.fm internet radio, April 12, 2010
- Talk on "The Universe in 2009" at York University Dept. of Physics & Astronomy High School Science Teachers' Night, Fall 2009
- Solar System talk to two audiences at the David Dunlop Observatory, October 3, 2009
- Solar System talk to 6th grade students at Islington Junior Middle School, March 26, 2009
- Hosted American Astronomical Society Shapley Lecturer Dr. Niel Brandt for a public talk and a colloquium at York, January 2009
- Staffed Department of Physics & Astronomy booth at annual Canadian Undergraduate Physics Conference (one 3-hour shift), October 2008
- Staffed Faculty of Science & Engineering booth at Ontario Universities' Fair (one 3.5-hour shift), September 2008
- Quasars and Black Holes talk to amateur astronomers at the annual Huronia Star Party, August 30, 2008
- Solar System talk to 4th-8th grade students at King Edward Public School, June 12, 2008
- Invited Scientist, Royal Canadian Institute for the Advancement of Science Gala Fund-Raising Dinner, April 24, 2008
- Spearheaded installation of approved U50 anniversary activity "A Scale Model of the Solar System at York," consisting of plaques installed in the Petrie building, January 2008 - May 2010
- Talk on 'Teaching the Big Bang' at Science Teachers' Association of Ontario (STAO) annual conference, Nov. 17, 2007

- Talk on ‘Thinking about the Big Bang’ to the Winnipeg chapter of the Royal Astronomical Society of Canada, October 2007
- Participant in the inaugural Youth Science and Technology Outreach Program “YSTOP @ York” Astronomy evenings for 8th-grade students, May 31 & June 3, 2007
- Conceived and organized the *Astronomy in Your Language* series of astronomy talks at York in four different languages, given by York faculty and graduate students, May 2007, featured in Y-File Apr. 23, 2007 — <http://www.yorku.ca/yfile/archive/index.asp?Article=8294> — and archived at <http://www.yorku.ca/phall/OUTREACH/>
- Chaired three-person science fact talk on Extrasolar Planets at Ad Astra annual science fiction fan conference in Toronto, Mar. 3, 2007
- Talk on Common Misconceptions in Astronomy at Science Teachers’ Association of Ontario (STAO) annual conference, Nov. 16, 2006
- Solar System talk to 8th grade students visiting York University, Nov. 15, 2006
- Departmental representative at the York University Graduate Open House, Nov. 11, 2006
- Interviewed for, and quoted in, Toronto Star article ‘Star-gazers praise plan to fix flagging Hubble’, Nov. 1, 2006
- Solar System talk to 4-6th grade students at the Ontario Science Center, Oct. 26, 2006
- Solar System talk to students at Cornerstone Academy, May 8, 2006
- Participation in evening stargazing event and panel talk on Planetariums at Ad Astra annual science fiction fan conference in Toronto, Apr. 1, 2006
- Solar System talk to visiting 8th grade students at York University, Nov. 17, 2005
- Solar System talk to 4-6th grade students at the Ontario Science Center, Oct. 25, 2005
- Galaxies and Our Universe talk to visiting high school students at York University, Dec. 8, 2004
- Solar System talk to visiting grade 10 students at York University, Nov. 9, 2004
- Public Sloan Digital Sky Survey talk to York University Astronomy Club, Sept. 28, 2004

Scientific Papers, Proposals, and Funding Applications Refereed

- One proposal for the Canada-France-Hawaii Telescope, October 2020
- One proposal for the Gemini International Telescopes, May 2020
- Paper for the Monthly Notices of the Royal Astronomical Society, October 2019 - December 2019
- Paper for Nature Astronomy, July 2018 - August 2018

- Paper for The Astrophysical Journal, January 2018
- Paper for The Astrophysical Journal, August 2017 - September 2017
- One proposal for the Gemini International Telescopes, April 2017
- One proposal for the Gemini International Telescopes, November 2016
- Two proposals for the China Telescope Access Program, October 2015
- Paper for Astronomy & Astrophysics, August 2015 - September 2015
- Paper for The Astrophysical Journal, July 2015 - February 2016
- Paper for The Astronomical Journal, May 2015 - October 2015
- Paper for The Astrophysical Journal Letters, August 2014 - January 2015
- Two proposals for the Gemini International Telescopes, October 2013
- One proposal for the Gemini International Telescopes, April 2013
- One proposal for the Canada-France-Hawaii Telescope, April 2013
- Paper for The Astrophysical Journal, October-December 2012
- One proposal for the Gemini International Telescopes, October 2012
- One proposal for the Canada-France-Hawaii Telescope, October 2012
- One proposal for the Gemini International Telescopes, April 2012
- Paper for Astronomy & Astrophysics, October 2011 - January 2012
- One proposal for the Netherlands Organisation for Scientific Research, November 2011
- One proposal for the Canada-France-Hawaii Telescope, October 2011
- One proposal each for the Canada-France-Hawaii and Gemini International Telescopes, April 2011
- One proposal for the Gemini International Telescopes, October 2010
- Paper for The Astrophysical Journal Letters, March 2010 - May 2010
- Paper for the Monthly Notices of the Royal Astronomical Society, December 2009 - July 2010
- Paper for The Astrophysical Journal, October 2009
- Paper for The Astrophysical Journal Letters, February 2008
- Paper for the Monthly Notices of the Royal Astronomical Society, January-February 2008
- One proposal for the Gemini International Telescopes, October 2007
- Paper for The Astrophysical Journal, January-May 2007

- Two proposals for the Gemini International Telescopes, April 2007
- One proposal for the Canada-France-Hawaii Telescope, April 2007
- Ontario Graduate Scholarship Panel Member, February 2007
- One proposal for the Gemini International Telescopes, October 2006
- One proposal for the Canada-France-Hawaii Telescope, October 2006
- Ontario Graduate Scholarship Panel Member, February 2006
- One proposal for the Gemini International Telescopes, April 2006
- One proposal for the Canada-France-Hawaii Telescope, April 2006
- One NSERC Discovery Grant proposal, January 2006
- Paper for The Astrophysical Journal, June-December 2005
- Paper for the Revista Mexicana de Astronomía y Astrofísica, March-October 2005
- One proposal for the Canada-France-Hawaii Telescope, October 2005
- Two proposals for the Gemini International Telescopes, October 2005
- Two proposals for the James Clerk Maxwell Telescope, April 2005
- One proposal for the Canada-France-Hawaii Telescope, April 2005
- One proposal for the Gemini International Telescopes, April 2005
- Paper for Astronomy & Astrophysics Letters, December 2004 - February 2005
- Paper for Astrophysical Journal Letters, December 2004
- Paper for Astrophysical Journal, September-December 2004
- One proposal for the Gemini International Telescopes, October 2004

Invited Colloquia and Seminars

- Queen's University, Physics & Astronomy Dept. Seminar, November 2019: 'Quasar Reverberation Mapping and the Maunakea Spectroscopic Explorer'
- York University, Physics & Astronomy Dept. Colloquium, October 2019: 'How to Learn About Quasars From Quite A Long Way Away'
- Virginia Polytechnic University, Physics & Astronomy Dept. Seminar, April 2019: 'Quasar Reverberation Mapping and the Maunakea Spectroscopic Explorer'
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- University of British Columbia, Dept. of Physics & Astronomy Cosmo-Pizza Seminar, March 2018: ‘Quasar Reverberation Mapping and the Maunakea Spectroscopic Explorer’
- University of Victoria, Dept. of Physics & Astronomy Seminar, January 2018: ‘Quasar Outflows: the Fast and the Furious’
- Western University, Dept. of Physics & Astronomy Colloquium, January 2016: ‘Quasar Outflows: the Fast and the Furious’
- Bucknell University, Dept. of Physics & Astronomy Seminar, October 2013: ‘Gas Falling Into Black Holes: A Surprising Discovery’
- University of Waterloo, Dept. of Physics & Astronomy Seminar, October 2012: ‘Broad Absorption Line Quasars with Redshifted Troughs’
- Virginia Polytechnic University, Physics & Astronomy Dept. Seminar, April 2012: ‘Gas Falling Into Black Holes: A Surprising Discovery’
- Penn State University, Astronomy Dept. Seminar, October 2011: ‘Gas Falling Into Black Holes: A Surprising Discovery’
- York University, Dept. of Physics & Astronomy Colloquium, October 2011: ‘Gas Falling Into Black Holes: A Surprising Discovery’
- University of Cambridge Institute of Astronomy Seminar, February 2011: ‘Feedback from Quasar Winds (But Not Jets)’
- Ohio University, Dept. of Physics & Astronomy Astrophysical Institute Seminar, November 2010: ‘Quasars: Some Answers, More Questions’
- St. Mary’s University, October 2008: ‘Quasar Accretion Disk Winds and Broad Emission Lines’
- Queen’s University, September 2008: ‘Quasar Accretion Disk Winds and Broad Emission Lines’
- University of Manitoba, October 2007: ‘Outflows from Quasars’
- Michigan State University, April 2007: ‘Constraints on Quasar Outflows’
- University of Oklahoma, April 2005: ‘Quasar Winds’
- University of Waterloo, March 2005: ‘Quasar Winds’
- University of Virginia, March 2004
- Leiden University, February 2004
- University of Notre Dame, January 2004
- York University, December 2003
- University of Wyoming, October 2003
- Penn State University, September 2003

- University of Toronto, May 2003
- State University of New York at Stony Brook, April 2003
- Universidad de Chile, April 2002
- Astronomy Department, American Museum of Natural History, November 2000
- Ohio State University, May 1999
- University of Toronto, September 1998
- Lawrence Livermore National Laboratory, January 1997

Memberships in Professional and Related Societies

- Canadian Association of Physicists (**2014-present**)
- Royal Astronomical Society of Canada (2008-2010)
- International Astronomical Union (**2003-present**)
- Sociedad Chilena de Astronomía (2002-2004)
- Canadian Astronomical Society (**1998-present**)
- Astronomical Society of the Pacific (1996-2010)
- American Astronomical Society (**1991-present**)

Research Skills

- Very experienced with longslit, multislit, and multifiber optical spectroscopy.
- Experienced with deep and wide-field optical and infrared imaging and reductions
- Experienced with optical/IR observing and 1-2m class telescope operation.
- Experienced with adaptive-optics infrared imaging and reductions.
- Experienced with acquisition and reduction of polarimetric data.
- Experienced with analysis of X-ray imaging data.
- Experienced with acquisition and reduction of SCUBA sub-millimeter data.
- Very experienced with IRAF as both software and programming language.
- Also experienced with SM, UNIX, L^AT_EX, MATLAB, SQL, Python, HTML, IDL, Perl, and FORTRAN.