

Contact Information

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Employment History

University of Toronto- Toronto, ON, Canada

Employment Dates: Sept. 2017 – Sept. 2019

NSERC Postdoctoral Fellow, Canadian Institute for Theoretical Astrophysics & Dunlap Institute for Astronomy and Astrophysics

Education

Johns Hopkins University- Baltimore, MD, USA

Graduation Date: July 2017

Masters in Astronomy June 2014

Dissertation: *Searching for Quasar Feedback in Obscured and Red Quasars at the Peak of Galaxy Formation*

Advisor: Dr. Nadia Zakamska

Princeton University- Princeton, NJ, USA

Graduation Date: June 2012

A.B. Magna Cum Laude in Astrophysical Sciences, Certificate in Planets and Life

GPA: 3.61, **Department GPA:** 3.63

Undergraduate Thesis: *Discovery of High Redshift Obscured Quasars in SDSS-III BOSS and Further Near-Infrared Spectroscopic Investigation*, Advisor: Dr. Michael Strauss

Awards

NSERC Postdoctoral Fellowship – National Science and Engineering Research Council of Canada

2017-2019

EJ Rhee Travel Grant- Johns Hopkins University Department of Physics and Astronomy

June 2016

Young Astronomer Travel Assistance Award- Astrophysical Research Consortium and the SDSS Collaboration

Nov. 2013

Student Presentation Award- Penn State Neighborhood Conference

April 4 2013

Rowland Research Fellowship- Johns Hopkins University Department of Physics and Astronomy

September 2012 – June 2013

Publications: 5 first author, 11 Nth author, H-index of 10

Alexandroff, Rachael M., Zakamska, Nadia L., Barth, Aaron J., Hamann, Fred, Strauss, Michael A., Krolik, Julian, Greene, Jenny E., Pâris, Isabelle, Ross, Nicholas P. 2018, [MNRAS, 479, 4936](#), “Spectropolarimetry of high-redshift obscured and red quasars”

Hwang, Hsiang-Chih, Zakamska, Nadia L., **Alexandroff, Rachael M.**, Hamann, Fred, Greene, Jenny E., Perrotta, Serena, Richards, Gordon T. 2018, [MNRAS, 477, 830](#), “Winds as the origin of radio emission in z=2.5 radio-quiet extremely red quasars”

Goulding, Andy D., Zakamska, Nadia L., **Alexandroff, Rachael M.**, Assef, Roberto J., Banerji, Manda, Hamann, Fred, Wylezalek, Dominika, Brandt, William N., Greene, Jenny E., Lansbury, George B. et al. 2018, [ApJ, 856, 4](#), “High-redshift Extremely Red Quasars in X-rays”

LaMassa, Stephanie M., Glikman, Eilatm Brusa, Marcella, Rigby, Jane R., Tasnim Ananna, Tonima, Stern, Daniel, Lira, Paulina, Urry, C. Megan, Salvato, Mara, **Alexandroff, Rachael**, et al. 2017, [ApJ, 847, 100](#), “The Hunt for Red Quasars: Luminous Obscured Black hole Growth Unveiled in the Stripe 82 X-Ray Survey”

Hamann, Fred, Zakamska, Nadia L., Ross, Nicholas, Paris, Isabelle, **Alexandroff, Rachael M.**, Villforth, Carolin, Richards, Gordon T., Herbst, Hanna, Brandt, W. Niel, Cook, Ben, et al. 2017, [MNRAS, 464, 3431](#), “Extremely Red Quasars in BOSS”

Alexandroff, Rachael M., Zakamska, Nadia L., van Velzen, Sjoert, Greene, Jenny E., Strauss, Michael A. 2016, [MNRAS, 463, 3056](#) “Sensitive Radio Survey of Obscured Quasar Candidates”

Zakamska, Nadia L., Hamann, Fred, Paris, Isabelle, Brandt, W. N., Greene, Jenny E., Strauss, Michael A., Villforth, Carolin, Wylezalek, Dominika, **Alexandroff, Rachael M.**, Ross, Nicholas P. 2016, [MNRAS, 459, 3144](#), “Discovery of extreme [OIII]5007A outflows in high-redshift red quasars”

Ross, Nicholas P., Hamann, Fred, Zakamska, Nadia L., Richards, Gorton T., Villforth, Carolin, Strauss, Michael A., Greene, Jenny E. **Alexandroff, Rachael A.**, Brandt, W. Niel, Liu, Guilin et al. 2015, [MNRAS, 453, 3932](#), “Extremely Red Quasars from SDSS, BOSS and WISE: Classification of Optical Spectra”

Alexandroff, Rachael A., Heckman, Timothy M., Borthakur Sanchayeeta, Overzier, Roderik, Leitherere Claus 2015, [ApJ, 810, 104](#), “Indirect Evidence for Escaping Ionizing Photons in Local Lyman Break Galaxy Analogs”

Heckman T. M., **Alexandroff, Rachael A.**, Borthakur, Sanchayeeta, Overzier, Roderik, Leitherer, Claus 2015, [ApJ, 809,147](#), “The Systematic Properties of the Warm Phase of Starburst-Driven Galactic Winds”

Greene, J.E., **Alexandroff, Rachael A.**, Strauss, Michael A., Zakamska, Nadia L., Lang, Dustin, Liu, Guilin, Pattarakijwanich, Petchara, Hamann, Frederick, Ross, Nicholas P., Myers, Adam D., et al. 2014, [ApJ, 788, 91](#), “Near Infrared Spectra and Intrinsic Luminosities of Candidate Type II Quasars at $2 < z < 3.4$ ”

Ahn, C.P., **Alexandroff, Rachael A.**, SDSS Collaboration et al. 2014, [ApJS, 211, 17](#), “The Tenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-III Apache Point Observatory Galactic Evolution Experiment”

Alexandroff, Rachael M., Strauss, Michael A., Greene, Jenny E., Zakamska, Nadia L., Ross, Nicholas P., Brandt, W. N., Liu, Guilin, Smith, Paul S., Ge, Jian, Hamann, Fred, et al. 2013, [MNRAS, 435, 3306](#), “Candidate Type II Quasars at $2 < z < 4.3$ in the Sloan Digital Sky Survey III”

Ahn, C.P., **Alexandroff, Rachael A.**, SDSS Collaboration et al. 2012, [ApJS, 203, 21](#), “The Ninth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-III Baryon Oscillation Spectroscopic Survey”

Steinhardt, Charles L., Schramm, Malte, Silverman, John D., **Alexandroff, Rachael M.**, Capak, Peter, Civano, Francesca, Elvis, Martin, Masters, Dan, Mobasher, Bahram, Pattarakijwanich, Petchara, Strauss, Michael A. 2012, [ApJ, 759, 24](#), “SDSS 0956+5128: A Broad-line Quasar with Extreme Velocity Offsets”

Alexandroff, Rachael M., Overzier, R. A., Paragi, Zsolt, Basu-Zych, Antara, Heckman, Tim, Kauffmann, Guinevere, Bourke, Stephen, Lobanov, Andrei, Ptak, Andy, Schiminovich, David 2012, [MNRAS, 423, 1325](#), “A search for AGN in the most extreme UV-selected starbursts using the European VLBI Network”

PI Grants

NASA Keck Observatory, Observing Grant 2015A_N159LpA- *NASA Exoplanet Science Institute* Dec. 2014
\$16,000

- Allowed for one night of observing on May 21, 2015 with Keck in the LRISp-ADC configuration
- Led to the first author paper Alexandroff et al. 2018, MNRAS, 479, 4936, “Spectropolarimetry of high-redshift obscured and red quasars”

Advising Experience

Hannah Sousa-Fronenberg – *University of Toronto* May-August 2018
University of Toronto Summer Undergraduate Research Program (sole supervisor)

- Hannah learned to reduce and analyze data from the Very Large Array to study the radio properties of radio quiet quasars

Hsiang-Chih Huang – *Johns Hopkins University* September 2016-May 2017
First Year Graduate Project (co-supervised with N. Zakamska)

- Hsiang-Chih studied the radio emission of high-redshift red quasars with my assistance in data reduction and analysis

- Resulted in one publication; Hwang, H.-C., Zakamska, N., **Alexandroff, R. et al.**, MNRAS, 477, 830, “Winds as the origin of radio emission in $z=2.5$ radio-quiet extremely red quasars”

Teaching Experience

Dunlap Instrument Instrumentation Summer School- *University of Toronto* August 2018

Lab Instructor for X-ray Spectroscopy

- Assisted upper-level undergraduate and new graduate students with CCD characterization and production of x-ray spectrum from Fe-55 source

AS.171.108 General Physics for Physical Science Majors- *Johns Hopkins* January – June 2016

Teaching Assistant for Dr. Petar Maksimovic

- Gained experience teaching in an active learning classroom by assisting with group problem solving during lecture
- Taught weekly section to reinforce concepts presented in class and to foster problem-solving skills

AS.171.612 Interstellar Medium and Astrophysical Fluid Dynamics- *Johns Hopkins* September – December 2015

Teaching Assistant for Dr. Colin Norman

- Taught weekly section on new concepts or to reinforce concepts presented in class
- Assisted in devising and setting homework problems as well as the final project

Professional Activities and Affiliations

American Astronomical Society-*Junior Member* August 2013 – Present

- Presented at poster session in the annual meeting Jan. 2012, Jan. 2015, Jan. 2018
- Thesis talk at the annual meeting Jan. 2018
- Chambliss poster presentation judge at the annual meeting Jan. 2017, Jan. 2018

University of Toronto Summer Undergraduate Research Program (SURP)- *Committee Member* Sept. 2017 – Present

- Co-organized the University of Toronto’s SURP in astronomy and astrophysics for summer 2018 for over thirty students
- Co-ordinated weekly Astronomy 101 teaching lectures by postdocs at the university

U of T Galaxy Evolution Journal Club- *Organizer* Jan. 2018 – Present

- Organize weekly journal club for approximately 10 participants from undergraduate students to faculty

JHU Physics and Astronomy Graduate Student Outreach- *President, Vice-President* June 2014 – Jan. 2016

- Organized two outreach events for 100+ community members with 15 volunteers and dozens of experiments
- Co-led construction and assembly of two portable planetaria for use in local Baltimore high schools
- Co-wrote successful proposal for Baltimore Ignition Grant 2012 (\$2000), JHU Alumni Association Grant 2015 (\$1495)

JHU Physics and Astronomy Diversity Committee- *Member* September 2013 – Present

- Organized grad school admissions panel attended by 30+ undergraduate students
- Helped invite Dr. Haythornthwaite as a colloquium speaker on mentorship to JHU’s Physics and Astronomy department

Space Studies Board of the National Research Council- *Washington, DC* June-August 2011

Lloyd V. Berkner Space Policy Internship

- Contributor to “Limiting Future Collision Risk to Spacecraft”; published policy report sent to relevant policy makers at Office of Management and Budget, Office of Science and Technology Policy, NASA
- Contributor to “Visions and Voyages for Planetary Science” popular edition; an abbreviated high-level presentation of the main findings and recommendations of the original
- Researched for and edited National Research Council reports on Planetary Science, Heliophysics, Flight Research

Select Presentations & Posters

Department Seminars/Colloquia (2 invited talks)

“Obscured and red quasars at the peak of galaxy formation”, McGill Space Institute, **Invited Seminar**, Montreal, February 2018

“Sensitive Radio Survey of Obscured Quasar Candidates”, Princeton Journal Club, talk, Princeton University, October 2017

“A Multi-wavelength Survey of Obscured and Reddened Quasars at the Peak of Galaxy Formation,” Rachael Alexandroff et al., HotSci **Invited Talk**, Space Telescope Science Institute, August 2016

Conference Presentations (8 Contributed Talks, 6 posters)

“Peering Deep in the Radio to Discover the Secrets of Quasar Feedback”, Rachael Alexandroff et al., The Environmental Dependence and Global Impact of AGN Activity Conference Poster Session, Durham University, August 2018

“Peering Deep in the Radio to Discover the Secrets of Quasar Feedback”, Rachael Alexandroff et al., Astrophysical Frontiers Contributed Talk, Portland, OR, June 2018

“Molecular gas in obscured and Extremely Red Quasars at $z \sim 2.5$ ” Rachael Alexandroff et al., AAS Conference Poster Session, Washington D.C., Jan. 2018, <http://adsabs.harvard.edu/abs/2018AAS...23125035A>

“Obscured and reddened quasars at the peak of galaxy formation: searching for multi-scale quasar winds,” Rachael Alexandroff et al., Elusive AGN Contributed Talk, George Mason University, June 2017

“A multi-wavelength survey of obscured and reddened quasars at the peak of galaxy formation”, Rachael Alexandroff et al., AAS Conference Contributed Thesis Talk, Dallas, Texas, Jan. 2017, <http://adsabs.harvard.edu/abs/2017AAS...22912102A>

“A Multi-wavelength Survey of Obscured and Reddened Quasars at the Peak of Galaxy Formation,” Rachael Alexandroff et al., Obscured AGN and Connections to Galaxy Evolution Contributed Talk, Dartmouth College, August 2016

“A Multi-wavelength Survey of Obscured and Reddened Quasars at the Peak of Galaxy Formation,” Rachael Alexandroff et al., The Interplay Between Local and Global Processes in Galaxy Formation Poster Session, Mexico, April 2016

“Indirect Evidence for Escaping Ionizing Photons in Local Lyman Break Galaxy Analogs,” Rachael Alexandroff et al., Hubble’s 25th Anniversary Symposium Poster Session, Space Telescope Science Institute, April 2015

“Indirect Evidence for Escaping Lyman Continuum Photons in Local Lyman Break Galaxy Analogs,” Rachael Alexandroff et al., AAS Conference Poster Session, Seattle Washington, Jan. 2015, <http://adsabs.harvard.edu/abs/2015AAS...22525109A>

“Candidate Type II Quasars at $2 < z < 4.2$ in the Sloan Digital Sky Survey Update: Near-infrared spectroscopy,” Rachael Alexandroff et al., The BOSS Collaboration Meeting Contributed Talk, Lawrence Berkeley National Laboratory, December 10, 2013

“Candidate Type II Quasars at $2.0 < z < 4.2$ in the Sloan Digital Sky Survey III,” Rachael Alexandroff et al., The SDSS-III Collaboration Meeting Contributed Talk, Johns Hopkins University, June 12, 2013

“Candidate Type II Quasars at $2.0 < z < 4.2$ in the Sloan Digital Sky Survey III,” Rachael Alexandroff et al., The Penn State Neighbourhood Workshop Contributed Talk, Penn State, April 4 2013; winner student presentation award

“A Search for High Redshift Type II Quasars from the SDSS BOSS Survey,” Rachael Alexandroff et al., The BOSS Collaboration Meeting Contributed Talk, New York University, Jan. 4 2012.

“Searching for High-Redshift Obscured Quasars in the Sloan Digital Sky Survey (SDSS) Baryonic Oscillation Spectroscopic Survey (BOSS),” Rachael Alexandroff et al., AAS Conference Poster Session, Austin Texas, Jan. 10 2012, <http://adsabs.harvard.edu/abs/2012AAS...21924304A>

Professional Development

- Johns Hopkins University Teaching Institute**-*Center for the Integration of Teaching, Research and Learning* May 2016
- Focused on techniques of active learning, diversity in the classroom and appropriate learning assessment
- ComSciCon Communicating Science Workshop**-*Cambridge, MA* June 2016
- Competitive application with 50 graduate student participants selected from over 800 applicants
 - Focused on science journalism, science advocacy, science outreach and K-12 education