Robert D. E. Henderson BSc, MSc, MBA, PhD

Curriculum Vitae

Contact Information

robert.henderson@usask.ca

Research Interests and Expertise

Biophysics

Nanotechnology

Nanomaterials

Nanopharmaceutics

Atomic Force Microscopy

Kelvin Probe Force Microscopy

Thin Film Techniques

Astrophysics

Theoretical Chemistry

Education

Doctor of Medicine *(2021)*
University of Saskatchewan
College of Medicine

Master of Business Administration *2017*
University of Saskatchewan
Edwards School of Business

Doctor of Philosophy (Physics) 2016
University of Waterloo, Department of Physics & Astronomy
Thesis: 'Nanoscale physics of surfactant gene delivery.'
Advisors: Prof. Zoya Leonenko and Dr. Shawn Wettig

Master of Science (Astrophysics) 2010
McMaster University, Department of Physics & Astronomy
Thesis: 'Faint members of distant galaxy groups,'
Advisor: Dr. Laura Parker

Bachelor of Science (Honours Mathematical Physics) 2008
University of Waterloo, Faculty of Science
Astrophysics and Biophysics Specialisations
Dean's Honours List

High School Diploma 2003
Northern Lights Secondary School, Moosonee, ON

Honours and Awards

- N. Murray Edwards MD/MBA Entrance Award 2016-17
- Waterloo Institute for Nanotechnology Nanofellowship (x3) 2012-15
- President's Graduate Scholarship (Waterloo, x2) 2010-12
- Ontario Graduate Scholarship (x2) 2010-12
- NSERC Canada Graduate Scholarship M 2009-10
- Ontario Graduate Scholarship 2008-09
- NSERC Undergraduate Student Research Award (x3) 2005-07

Teaching Experience

Teaching Assistant 2016-17
University of Saskatchewan, Edwards School of Business
COMM 101 (Introduction to Business): marking.

Lecturer 2015 - 2016
University of Waterloo, Faculties of Science and of Mathematics
Course Instruction:

MNS 102	*Techniques for Materials and Nanosciences* Sole instructor; taught at Beijing Jiaotong University, Beijing, China on behalf of Waterloo.	Spring 2016
MATH 104	*Calculus for Arts and Social Science* Sole instructor	Winter 2016
MATH 103	*Algebra for Arts and Social Science* Sole instructor	Fall 2015
SCI 10	*Communication Skills for Physics and Chemistry* Designed and taught this first time offering of course (section under EARTH 10 code).	Fall 2015
SCI 238	*Introductory Astronomy* Sole instructor	Spring 2015

Teaching Assistant 2010-16
University of Waterloo, Department of Physics & Astronomy
First year physics; head TA for laboratories.

Teaching Assistant 2008-10
McMaster University, Department of Physics & Astronomy
First year physics, laboratories, and astronomy; tutorial instruction; head TA for first year physics for life sciences.

Undergraduate Teaching Assistant 2004-08
University of Waterloo, Department of Physics & Astronomy
First year physics help centre; physics for engineers.

Public Outreach

Coordinator, Gustav Bakos Observatory 2010 –2016
University of Waterloo
Public and private tours and lectures; radio and television appearances (CTV News, RogersTV *Talk Local*, CBC Kitchener-Waterloo, CP24 Toronto).

Judge and Team Captain, Canada Wide Science Fair, Toronto, 2011

Presenter, William J. McCallion Planetarium McMaster University 2008-10

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Publications

Refereed Journal Articles

1. Ahmed, T., Chau, J., Madkhali, O.; Henderson, R.D.E., Kamel, A. O., Leonenko, Z., Mekhail, G. and Wettig, S. 'Understanding the role of components of gemini surfactant-DOPE-DNA gene transfection formulations: A Langmuir monolayer study', *submitted to Langmuir*.

2. Liu, G., Zhao, S., Henderson, R.D.E., Leonenko, Z., Abdel-Rahman, E., Mi, Z. and Ban, D., 'Nanogenerators based on vertically aligned InN nanowires', 2016, Nanoscale, 8 (4), 2097-2106.

3. Henderson, R.D.E., Shayesteh, A., Haugen, C.C., Tao, J., Bernath, P.F. and Le Roy, R.J., 'Accurate analytic potential and Born-Oppenheimer breakdown functions for MgH and MgD from a direct-potential-fit data analysis', 2013, J. Phys. Chem. A, 117 (50), 13373-13387.

4. Connelly, J.L., Wilman, D.J., Finoguenov, A., Hou, A., Mulchaey, J.S., McGee, S.L., Balogh, M.L., Parker, L.C., Saglia, R., Henderson, R.D.E. and Bower, R.G., 'Exploring the diversity of groups at $0.1 < z < 0.8$ with X-Ray and optically selected samples', 2012, Astrophys. J., 756, 2.

5. McGee, S., Balogh, M.L., Henderson, R.D.E., Wilman, D.J., Bower, R.G., Mulchaey, J.S. and Oemler, A., 'Evolution in the disks and bulges of group galaxies since $z = 0.4$', 2008, Mon. Not. R. Ast. Soc., 387, 1605.

6. Shayesteh, A., Henderson, R.D.E., Le Roy, R.J. and Bernath, P.F., 'Ground state potential energy curve and dissociation energy of MgH', 2007, J. Phys. Chem. A, 111, 12495-12505.

7. Le Roy, R.J. and Henderson, R.D.E., 'A new potential function form incorporating extended long-range behaviour: application to ground-state Ca_2', 2007, Mol. Phys., 105, 691.

8. Balogh, M.L., Wilman, D.J., Henderson, R.D.E., Bower, R.G., Gilbank, D., Whitaker, R., Morris, S.L., Hau, G., Mulchaey, J.S., Oemler, A. and Carlberg, R.G., 'The stellar mass content of distant galaxy groups', 2007, Mon. Not. R. Ast. Soc., 374, 1169.

Conference and Seminar Contributions

1. Henderson, R.D.E., Wettig, S. and Leonenko, Z., 'Kelvin Probe Force Microscopy Reveals Electrostatic Properties of Interactions of DNA and Gemini Surfactant-Lipid Monolayers', Biophysical Society of Canada Annual Meeting, University of Waterloo, Waterloo, Ontario. June, 2015. (Poster)

2. Henderson, R.D.E., Wettig, S. and Leonenko, Z., 'Exploring the interactions of gemini surfactant and lipid monolayers with atomic force and Kelvin probe force microscopy', Waterloo Institute for Nanotechnology Graduate Student Seminar, University of Waterloo, September, 2014. (Talk)

3. Henderson, R.D.E., Wettig, S. and Leonenko, Z., 'Kelvin Probe Force Microscopy Reveals Electrostatic Properties of Interactions of DNA and Gemini Surfactant-Lipid Monolayers', International Materials Research Congress, Mexico. Ausust, 2014. (Poster, presented by ZL)

4. Henderson, R.D.E., Gaikwad, R., Wettig, S. and Leonenko, Z., 'Using atomic and Kelvin probe force microscopy to study gemini surfactants', Conference on Nanomaterial Futures 2013, Bristol University, Bristol, UK. February 2013. (Talk)

5. Henderson, R.D.E., Gaikwad, R., Wettig, S. and Leonenko, Z., 'A Kelvin probe force microscopy study of lipid monolayers with gemini surfactant.' International Scanning Probe Microscopy Conference 2012. Toronto, Ontario. June 2012. (Poster)

6. Henderson, R.D.E., Parker, L. and Wilman, D., 'Faint members of distant galaxy groups.' Canadian Astronomical Society (CASCA) Meeting 2010. St. Mary's University, Halifax, NS, Canada. May 2010. (Talk)

7. Henderson, R.D.E., Parker, L. and Wilman, D., 'Deep FORS2 spectroscopy of distant groups in the CNOC2 survey.' CNOC2 Galaxy Group Collaboration Meeting, Durham University, Durham, UK, July 2009. (Talk)

8. Henderson, R.D.E., Parker, L. and Wilman, D., 'Faint members of distant galaxy groups.' Canadian Astronomical Society (CASCA) Meeting 2009. University of Toronto, Toronto, ON, Canada. May 2019. (Poster)

9. Henderson, R.D.E. and Balogh, M.L., 'Morphological evolution of distant galaxy groups.' Canadian Undergraduate Physics Conference 2007. Simon Fraser University, Vancouver, BC, Canada, October 2007. (Talk)

10. Henderson, R.D.E. and Balogh, M.L., 'The stellar mass content of distant galaxy groups.' Canadian Undergraduate Physics Conference 2006. University of New Brunswick, Fredericton, NB, Canada, October 2006. (Talk)

Non-refereed Articles

1. Mathias, K.L., Henderson, R.D.E. and Tjahjadi, A., 'Graduate Student Advocacy Research Report', January 2013, Graduate Student Association, University of Waterloo.
2. Henderson, R.D.E., 'Canadian Undergraduate Physics Conference 2006: A Synopsis', Fall 2006, Phys13News, Department of Physics & Astronomy, University of Waterloo, No. 120.
3. Henderson, R.D.E., 'Don't kill the starry messenger', Spring 2006, Phys13News, Department of Physics & Astronomy, University of Waterloo, No. 118.

Other Research Experience

Research Assistant 01-08/2008
University of Waterloo, Department of Chemistry
Advisor: Prof. Robert J. Le Roy
Project: 'Direct-potential-fit analysis of new MgD spectra.'

NSERC Undergraduate Research Student 05-08/2007
University of Victoria, Department of Physics & Astronomy
Advisor: Dr. Jon Willis
Project: 'Constraining dark matter properties of galaxy haloes from gravitationally lensed quasars.'

Senior Undergraduate Thesis 09-12/2006
University of Waterloo, Department of Physics & Astronomy
Advisor: Prof. Michael L. Balogh
Project: 'Morphological evolution of group galaxies.'

NSERC Undergraduate Research Student 05-08/2006
University of Waterloo, Department of Chemistry
Advisor: Prof. Robert J̇Le Roy
Project: 'Direct-potential-fit analysis of diatomic molecular spectra.'

NSERC Undergraduate Research Student 05-08/2005
University of Waterloo, Department of Physics & Astronomy
Advisor: Prof. Michael L. Balogh
Project: 'Near-infrared luminosity functions of group galaxies.'

Service

University of Saskatchewan

Member of Senate, University of Saskatchewan 2018 - present

MD Program Curriculum Committee, College of Medicine 2017 - present
Subcommittee: Program Evaluation

Governance Committee, University Council 2017 - 18
Student representative

University of Waterloo Boards and Committees (Selected)

Board of Governors, University of Waterloo 2013-16
Committees: Building & Properties (2013-15), Executive (2013-15).

Senate, University of Waterloo 2012-16
Committees: Graduate & Research Council (2013-14);
Executive (2012-15); Finance (2015-16).
Ad hoc working groups: Course Evaluation Project Team;
Fall Break Working Group.

Graduate Student Association Board of Directors 2012-15
Chair, 2013-14
Committee service: Audit, Student Affairs, Long Range Planning, Governance Review.

Graduate Studies Endowment Fund Board of Directors 2012-15
Chair, 2015
Project Review Committee, 2011-13.

Graduate Student Relations Committee 2012-15
Co-chair, 2013-14.

University Tenure and Promotion Committee 2012-15

Student Services Advisory Committee 2012-15

Provost's Advisory Committee for Timetabling 2012-15

Hiring, Interview and Nominating Committees 2011-15
Chancellor; Vice President University Research (x2); Dean of Science (x2); Registrar; Director, Student Success; Director, Athletics.

Other

Biophysical Society of Canada Executive - Trainee Representative 2015 – 2016

University of Waterloo Ballroom Dance Club Executive 2008 – 2016
University of Waterloo, Department of Athletics & Recreation

Convocation Usher 2008 – 2016
University of Waterloo, Office of the Registrar

University of Waterloo Ballroom Fencing Club Executive 2006 – 2008
University of Waterloo, Department of Athletics & Recreation
Recipient of the 2008 Outstanding Graduating Senior Award for service.

Other Professional Experience

Consulting Research Assistant 2015 – 2016

University of Waterloo, Student Success Office

- Data analysis and research to support student success initiatives: effectiveness of course components in learning; markers and metrics for transfer student success.

VP Student Affairs 2014-15, 2012-13

Graduate Student Association, University of Waterloo

- Represented graduate students to university administration on issues of a non-academic nature, including health and safety, student services and funding.
- Initiated the first graduate student orientation program at Waterloo, and chaired the Graduate Orientation Committee 2012-2013.
- Led the development and introduction of a teaching assistant time allocation form; initiated development of a new university TA policy.

President 2013-14

Graduate Student Association, University of Waterloo

- Responsible for the overall function of the GSA, its staff and general management. (Total staff: 4 full-time, 15+ casual. Budget $2.3M/yr.)
- Chief representative of graduate students when interacting with university administration.
- Member if many high-level university committees and governing bodies, including Senate and the Board of Governors.
- Chair of the GSA Board of Directors.

Diagnostic Imaging Assistant 08/2004

Hay River Health and Social Services Authority
Hay River, NWT

- Provided administrative support to the Diagnostic Imaging department. Duties included the creation and maintenance of patient diagnostic imaging records, cross-checking radiology reports, providing assistance during emergency situations, scheduling appointments, and general darkroom tasks.

Human Resources Administrative Assistant 07/2004

Hay River Health and Social Services Authority
Hay River, NWT

- Provided administrative support to the director of Human Resources, where duties included the creation and maintenance of employee records in strict confidence.