

Catherine A. Whiting

Assistant Professor
Physical and Environmental Sciences
Physics Program
Colorado Mesa University
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EDUCATION

University of Iowa Ph.D. in Physics – Thesis: “Duality Symmetries in String-Inspired Supergravity: T-Dualities and the Gauge/Gravity Correspondence”	Iowa City, IA 2010 - 2015
University of Iowa M.S. in Astronomy – Thesis: “Considerations for Expanded Very Large Array Coronal Faraday Rotation Measurements”	Iowa City, IA 2008–2010
University of Iowa B.S. in Physics, Astronomy, and Mathematics, with High Distinction	Iowa City, IA 2004–2008

APPOINTMENTS

Colorado Mesa University Assistant Professor	Grand Junction, CO Fall 2020- present
Bates College Visiting Assistant Professor,	Lewiston, ME 2018-2020
University of the Witwatersrand Postdoctoral Fellow at National Institute for Theoretical Physics	Johannesburg, South Africa 2015-2018
University of the Witwatersrand Sessional Lecturer, School of Physics	Johannesburg, South Africa 2017
University of Iowa Graduate Teaching Assistant, Department of Physics and Astronomy	Iowa City, IA 2009-2015
Grinnell College Lecturer	Grinnell, IA 2014
University of Iowa Graduate Research Assistant, Department of Physics and Astronomy	Iowa City, IA 2008-2009
University of Iowa Undergraduate Research Assistant, Department of Physics and Astronomy	Iowa City, IA 2005-2008
Institute for Astronomy, University of Hawaii Summer REU Intern	Honolulu, HI 2007
National Radio Astronomy Observatory, Array Operations Center Summer REU Intern	Socorro, NM 2006
University of Iowa Peer Tutor, TRiO Student Support Services	Iowa City, IA 2008-2013

TEACHING

- **Assistant Professor** at Colorado Mesa University Fall 2020 - current
PHYS 103: General Astronomy (Spring 2023)
PHYS 103L: General Astronomy Lab (2 sections) (Spring 2023)
PHYS 101: Elementary Astronomy (Fall 2020, Spring 2021, Fall 2021, Spring 2022, Fall 2022, Spring 2023)
PHYS 111L: General Physics Lab (Spring 2022 (2 sections), Spring 2023 (2 sections))
PHYS 132L: Electromagnetism and Optics Lab (Fall 2022)
PHYS 111: General Physics (Fall 2020 (2 sections), Spring 2021 (2 sections), Fall 2021, Spring 2022, Fall 2022 (2 sections))
PHYS 372: General Relativity (Spring 2022)
PHYS 395: Independent Study (Fall 2021), supervised Nicholas Harshman in research
PHYS 472: Computational Physics (Fall 2021)
PHYS 494: Physics Seminar (Fall 2021, Spring 2022)
- **Visiting Assistant Professor** at Bates College Fall 2018 - Winter 2020
PHYS 108: Introduction to Modern Physics (Winter 2020)
PHYS 211: Newtonian Mechanics (Fall 2019)
PHYS 107: Classical Physics (Fall 2019, Fall 2018)
PHYS 107L: Classical Physics Lab (Fall 2019)
ATPH 336: General Relativity (Winter 2019)
PHYS 108L: Modern Physics Lab (Winter 2019)
- **Sessional Lecturer** at University of the Witwatersrand, School of Physics 4th Teaching Block, 2017
PHYS4021A: Introduction to General Relativity, Undergraduate Honours Level, co-taught with Nilanjan Sircar
- **Graduate Teaching Assistant** at University of Iowa Fall 2009 - Spring 2015
PHYS:1702: Physics II Lab (Spring 2015, Spring 2014)
PHYS:1612: Introductory Physics I TIRE Discussion (Spring 2015)
PHYS:7760: General Relativity and Cosmology (Spring 2015), graduate level, grader
PHYS:7740: Quantum Field Theory (Fall 2014), graduate level, grader
PHYS:1702: Physics I Lab (Fall 2014)
PHYS:1611: Introductory Physics I Lab (Summer 2014)
ASTR:1771: General Astronomy Lab (Fall 2013, Fall 2012, Fall 2010 (Lead TA))
PHYS:1511: College Physics I Lab (Summer 2013)
ASTR:1772: General Astronomy II Lab (Spring 2013, Spring 2012, Spring 2011, Spring 2010)
ASTR:1070: Stars, Galaxies, and the Universe Lab (Spring 2013, Fall 2012, Summer 2012, Fall 2011, Fall 2010 (Lead TA), Fall 2009)
ASTR:1079: Introductory Astronomy Lab (Spring 2013, Fall 2012, Summer 2012, Fall 2011, Fall 2009)
ASTR:7775: Special Topics in Astrophysics (Fall 2012), graduate level, grader
PHYS:1612: Introductory Physics II Lab (Spring 2011)
Physics and Astronomy Department Drop-In Tutorial Room Tutor, Fall 2009-Spring 2015
- **Lecturer** at Grinnell College Spring 2014
PHY:132 Lab: General Physics II Lab (Spring 2014)

PUBLICATIONS

- [1] M. Abdullah, C. Bavor, B. Chafamo, X. Jiang, M. H. Kalim, K. Stiffler, and C. A. Whiting, “Inflation from dynamical projective connections”, *Phys. Rev. D*, vol. 106, no. 8, p. 084049, 2022. arXiv: 2203.04435 [hep-th].
- [2] S. Brensinger, K. Heitritter, V. G. J. Rodgers, K. Stiffler, and C. A. Whiting, “Dark Energy From Dynamical Projective Connections”, *Class. Quant. Grav.*, vol. 37, no. 5, p. 055003, 2020. arXiv: 1907.05334 [hep-th].
- [3] R. Terrisse, D. Tsimpis, and C. A. Whiting, “D-branes and non-Abelian T-duality”, *Nucl. Phys. B*, vol. 947, p. 114733, 2019. arXiv: 1811.05800 [hep-th].

- [4] L. A. Pando Zayas, D. Tsimpis, and C. A. Whiting, “Supersymmetric IIB background with AdS₄ vacua from massive IIA supergravity”, *Phys. Rev. D*, vol. 96, no. 4, p. 046 013, 2017. arXiv: 1701.01643 [hep-th].
- [5] L. A. Pando Zayas, V. G. J. Rodgers, and C. A. Whiting, “Supergravity solutions with AdS₄ from non-Abelian T-dualities”, *JHEP*, vol. 02, p. 061, 2016. arXiv: 1511.05991 [hep-th].
- [6] N. T. Macpherson, C. Núñez, L. A. Pando Zayas, V. G. J. Rodgers, and C. A. Whiting, “Type IIB supergravity solutions with AdS₅ from Abelian and non-Abelian T dualities”, *JHEP*, vol. 02, p. 040, 2015. arXiv: 1410.2650 [hep-th].
- [7] B. K. Button, L. Rodriguez, C. A. Whiting, and T. Yildirim, “A Near Horizon CFT Dual for Kerr-Newman-AdS”, *Int. J. Mod. Phys. A*, vol. 26, pp. 3077–3090, 2011. arXiv: 1009.1661 [hep-th].
- [8] S. R. Spangler and C. A. Whiting, “Radio Remote Sensing of the Corona and the Solar Wind”, *IAU Symp.*, vol. 257, N. Gopalswamy and D. F. Webb, Eds., pp. 529–541, 2009. arXiv: 0809.4645 [astro-ph].
- [9] C. A. Whiting, S. R. Spangler, L. D. Ingleby, and L. M. Haffner, “Confirmation of a Faraday Rotation Measure Anomaly in Cygnus”, *Astrophys. J.*, vol. 694, pp. 1452–1463, 2009. arXiv: 0802.0481 [astro-ph].
- [10] L. D. Ingleby, S. R. Spangler, and C. A. Whiting, “Probing the Large Scale Plasma Structure of the Solar Corona with Faraday Rotation Measurements”, *Astrophys. J.*, vol. 668, pp. 520–532, 2007. arXiv: astro-ph/0701538.

TECHNICAL REPORTS

- Expanded Very Large Array Memorandum, Catherine A. Whiting and Steven R. Spangler, *EVLA Measurements Close to the Sun: Elevated System Temperatures*, 2009, EVLA Memo # 136

GRANTS

- **Faculty Professional Development Grant**, Colorado Mesa University 2022 - 2023
Awarded \$1660 for travel to the 242nd American Astronomical Society Conference in Albuquerque, NM, USA from June 4 - 9, 2023
- **CMU Maverick Open Resource Educators Grant**, Colorado Mesa University 2022 - 2023
Awarded \$3500 to convert PHYS 101 to using the OpenStax Astronomy 2e textbook
- **Faculty Professional Development Grant**, Colorado Mesa University 2021 - 2022
Awarded \$2320 for travel to the XV International Conference on Interconnections between Particle Physics and Cosmology from June 6-10, 2022 in St. Louis, MO, USA and the 240th American Astronomical Society Meeting from June 12-16, 2022 in Pasadena, CA, USA
- **OER Grant Program 2021-22**, Colorado Department of Higher Education 2021 - 2022
Developing and Implementing Open Education Resources (OER) Materials for GT-Pathways Introductory Physics Courses (PHYS 111, 112, 131, 132) at Colorado Mesa University
Dr. Youngmin Kim (PI), Dr. Brian Hosterman (Co-PI), and Dr. Catherine Whiting (Co-PI)
Awarded \$9600 (split evenly) to produce reading quizzes and active learning in-class materials for the OpenStax College Physics textbook for PHYS 111
- **Summer Research Apprenticeship Grant**, Bates College Faculty Scholarship Committee Summer 2020
Awarded to Muhammad Abdullah and Muhammed Hamza Kalim for summer research stipend
- **Summer Research Apprenticeship Grant**, Bates College Faculty Scholarship Committee Summer 2019
Awarded to Yehe Yan for summer research stipend

AWARDS AND SCHOLARSHIPS

- **Bates College Stipend** 2019-2020
*Assisted development of introductory physics course aimed at physics majors
Bates College, Howard Hughes Medical Institute (HHMI) Inclusive Excellence Grant*
- **Outstanding Teaching Assistant Award** 2013
University of Iowa
- **Meshkov Award** 2012
*Miami 2012 Conference Software Award
Awarded a student Mathematica license for best graduate student talk*
- **Best theory poster** 2011
2011 Meeting of the Division of Particles and Fields of the American Physical Society
- **Barry M. Goldwater Scholarship** 2007
Nationwide
- **Bill and John Fenton Scholarship** 2006
University of Iowa
- **Myrtle K. Maier Scholarship in Physics and Astronomy** 2006, renewal 2007
University of Iowa
- **Strayer-Rairden Scholarship in Physics and Astronomy** 2004-2008, annually
University of Iowa

INVITED TALKS

- **James Webb: Our Origins** October 2020
Physics Seminar, Department of Physical and Environmental Sciences, Colorado Mesa University
- **Cosmological Inflation from Projective Gravity** September 2020
Physics Seminar, Department of Physical and Environmental Sciences, Colorado Mesa University
- **D2 Brane Solutions of Supergravity and non-Abelian T-duality** April 2018
Nuclear and Particle Physics Seminar, Department of Physics and Astronomy, University of Iowa
- **New AdS Supergravity Backgrounds from non-Abelian T-dualities** July 2016
Latin American Conference on High Energy Physics: Particles and Strings II, Havana, Cuba
- **Non-Abelian T-duality and AdS/CFT** April 2016
Mandelstam Institute for Theoretical Physics Seminar, University of the Witwatersrand, South Africa
- **Type IIB Supergravity Backgrounds via Non-Abelian and Abelian T-Dualities** June 2014
Mexicuerdas, Universidad de Colima, Colima, Mexico
- **Non-Abelian T-duality and String Theory** April 2014
Grinnell College Physics Seminar, Grinnell College, IA

CONTRIBUTED TALKS

- **Inflation from a New Gravitational Model** June 2022
240th American Astronomical Society Meeting, Pasadena, CA
- **Inflation from Dynamical Projective Connections** June 2022
*XV International Conference on the Interconnections Between Particle Physics and Cosmology, Washington
University in St. Louis, MO*
- **Astronomy at CMU and Western Colorado** September 2021
*Physics Seminar, Department of Physical and Environmental Sciences, Colorado Mesa University, Grand Junction,
CO*

- **A New Supersymmetric IIB Background with AdS4 from Massive IIA** January 2017
The First Mandelstam Theoretical Physics School and Workshop: Recent Advances in AdS/CFT, Durban, South Africa
- **NS5 Branes on the Resolved Cone Over $Y^{p,q}$** April 2013
American Physical Society April Meeting, Denver, CO
- **‘Confining’ Geometries Dual to Strongly Coupled Field Theories** December 2012
Miami 2012 Conference, Ft. Lauderdale, FL
- **NS5 Branes on the Resolved Cone Over $Y^{p,q}$** September 2012
Midwest Theory Get Together Conference, Argonne National Lab

POSTER PRESENTATIONS

- **NS5 Branes on the Resolved Cone over $Y^{p,q}$** 2011
Catherine Whiting, V.G.J. Rodgers, E. Caceres, L. Pando Zayas, L. Rodriguez, Meeting of the Division of Particles and Fields of the American Physical Society, Brown University, Providence, RI
- **Radio Remote Sensing of the Solar Corona with the EVLA** 2010
Catherine Whiting and S.R. Spangler, 215th American Astronomical Society Meeting, Washington, DC
- **Faraday Rotation Measure Anomaly due to the Cygnus OB1 Association** 2008
Catherine Whiting, S.R. Spangler, L.D. Ingleby, M.L. Haffner, 211th American Astronomical Society Meeting, Austin, TX
- **VLA Imaging of Cygnus X-3 Jets at 8.5 GHZ** 2007
Whiting, Catherine A., Rupen, M., Mioduszewski, A., 209th American Astronomical Society Meeting, Seattle, WA

PUBLIC LECTURES

- **Planetary Formation** November 1, 2022
Joint Meeting of the Western Colorado Astronomy Club and the CMU Astronomy Club
- **James Webb: Our Origins** September 16, 2022
NASA Webb Event, Arches National Park Keynote Presentation
- **Black Holes and General Relativity** January 11, 2022
Joint Meeting of the Western Colorado Astronomy Club and the Black Canyon Astronomical Society
- **Black Holes** April 2014
Café Scientifique of Iowa City
- **Dark Matter** July 2013
Eastern Iowa Observatory and Learning Center
- **Big Bang! A History of the Universe** Summer 2013
University of Iowa Lifetime Enrichment Adult Program (LEAP) Course Instructor
- **Black Holes** August 2012
Eastern Iowa Observatory and Learning Center

PRESENTATIONS AT PEDAGOGICAL WORKSHOPS

- **OERs in CMU courses** December 3, 2021
Teacher 2 Teacher Event, Colorado Mesa University
- **Look Who’s Talking: Speaking Across the Disciplines** October 27, 2021
Teacher 2 Teacher Event, Colorado Mesa University on assessing and evaluating speaking
- **Teaching Techniques: How to be Effective in Front of the Classroom** August 2014

- **Best Practices in Tutoring** August 2012
Campus Tutor Training Workshop, TRiO Student Support Services, University of Iowa

PARTICIPATION AT PEDAGOGICAL WORKSHOPS

- **CMU Faculty Professional Development Workshop** September 23, 2022
Colorado Mesa University
- **CMU Faculty Professional Development Workshop** January 21, 2022
Colorado Mesa University
- **CMU Faculty Professional Development Workshop** August 20, 2021
Colorado Mesa University
- **American Association of Physics Teachers 2021 New Faculty Workshop** June 28 - July 21 2021
held virtually
- **Pedagogy Nuts & Bolts Workshops for new faculty** September - October 2019
Bates College
- **Pedagogy Matters Conference** August 23, 2019
Bates College
- **Let One Idea Spark Another: The Pedagogy of the Seminar** May 10, 2019
May Conference, Bates College
- **Development and Use of Open Educational Resources in Higher Education** April 26, 2019
April Conference, Bates College
- **CUREs (Course-Based Undergraduate Research Experiences) Workshops** January - March 2019
Bates College
- **First ISLS (International Society of the Learning Sciences) Workshop** February 12-13, 2018
University of the Witwatersrand, Johannesburg, South Africa

RESEARCH ADVISING

- **Calvin Bavor**, senior undergraduate, Colorado Mesa University May 2021 - May 2022
Summer research 2021, Senior research Fall 2021 - Spring 2022
Currently a Ph.D. student at Colorado School of Mines
- **Nicholas Harshman**, senior undergraduate, Colorado Mesa University August 2020 - August 2021
Senior research project Fall 2020 - Spring 2021, Summer research 2021 and independent study Fall 2021
Currently a M.S. student at University of Iowa
- **Eisho Takatsuji**, junior undergraduate, Bates College May - July 2020
Hoffman Fellowship, Summer research
- **Muhammed Hamza Kalim, Bates College**, freshman undergraduate May - July 2020
Summer Research
- **Muhammad Abdullah**, sophomore undergraduate, Bates College May - July 2020
Summer research
Currently an engineering graduate student at Penn State
- **Yehe Yan**, junior undergraduate, Bates College July - December 2019
Summer Research Apprentice 2019, Senior Thesis Fall 2019
Received M.S. in physics from University of Edinburgh
- **Biruk Chafamo**, freshman undergraduate, Bates College June - August 2019
Summer Research Fellow

- **Xiaole Jiang**, sophomore undergraduate, Bates College May - July 2019
Summer Research Fellow
Currently a physics Ph.D. student at CUNY
- **Godefroy Griva Bissouta**, Master's student, AIMS Cameroon April - May 2018
African Institute for Mathematical Sciences (AIMS) Cameroon, Virtual Advisor
Masters Essay: 'Tests of General Relativity with Gravitational Waves Observations'

SERVICE

- **Member of Doxsey Travel Prize Committee** 2022-current
American Astronomical Society
Reviewed and scored 100+ abstracts bi-annually, Participated in committee meetings
- **Faculty Advisor** 2022-current
Astronomy Club, Colorado Mesa University Student Club
- **Faculty Advisor** 2022-current
Girl Gains Club, Colorado Mesa University Student Club
- **Member of Student Showcase Committee** 2020-current
Colorado Mesa University
PES Representative: participated in committee meetings, organized PES abstracts into tracks, answered student/faculty emails, organized Judging, distributed awards
- **Member of Graduate Curriculum Committee** 2021-current
Colorado Mesa University
PES Representative: participated in committee meetings, reviewed curriculum proposals and changes
- **Member of 2022 Chemistry Instructor Search Committee** 2021-2022
Colorado Mesa University
Reviewed Applications, Participated in committee meetings, Zoom Interviews, in-person interviews
- **Member of 2020-2021 Chemistry Tenure Track Search Committee** 2020-2021
Colorado Mesa University
Reviewed applications, participated in committee meetings, Zoom interviews, in-person interviews
- **Member of 2020 TRiO STEM Navigator Hiring Committee** 2020
Colorado Mesa University
Reviewed applications, participated in committee meetings, Zoom interviews
- **Reviewer** 2018
American Journal of Physics, 1 article
- **Theory group Journal Club Organizer** 2016-2018
School of Physics, University of the Witwatersrand, South Africa
- **External Examiner** 2016
Undergraduate Honours Physics Project (PHY 700)
Department of Physics, University of Pretoria, Pretoria, South Africa

MEMBERSHIPS

- **American Astronomical Society** 2022 - current
Full Member
- **Western Colorado Astronomy Club** 2020 - current
Honorary Member
- **Black Canyon Astronomical Society** 2020 - current
Active Member

PUBLIC OUTREACH

- **Volunteer**, Stargazing on the Monument July - September 2022
Colorado National Monument, Fruita, CO
Controlled a telescope, talked to the public, answered questions
- **Astronomy Guide**, Centennial Canoe trip June 25 - 27, 2022
Gave night sky tour and solar observing presentations with a telescope
- **Summer Camp Lesson Coordinator**, Eureka! Science Museum May 31, 2022
Aerospace Engineering and Astronomy Summer Camp
Coordinated lessons with CMU student Collin Stout
- **Summer Camp Lesson Instructor**, Eureka! Science Museum July 29, 2021
Aerospace Engineering and Astronomy Summer Camp
Designed and taught lessons
- **Guest Speaker**, Grand Junction Tiger Cub Scouts January 27, 2021
Virtual Astronomy 'The Sky is the Limit' Meeting
- **Job Shadowing Mentor**, High School Student July 2017
National Institute for Theoretical Physics, University of the Witwatersrand, South Africa
- **Volunteer**, Hawkeyes on Science 2007 - 2015
University of Iowa Physics Department outreach group, numerous events
- **Volunteer and Designer** 2007 - 2015
University of Iowa Department of Physics and Astronomy Public Demonstration Shows held yearly
- **Volunteer**, North Tama Elementary School February 2012
Mars Rover STEM Day, North Tama, IA