

MOJGAN MATLOOB HAGHANIKAR

Physics PhD

Physics and Astronomy Education

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Key words: Physics, Astronomy, Education, Assessment, Multidisciplinary, Informal, life sciences, author, consultant, Biology, Virtual, Technology, Immersive, Experimental, labs, Video analysis, Statistics, Interactive, Modeling, Grant, Pedagogy, Design, Online, Data mining, Data Science, SETI Institute, logistics regression, Teaching, Assistant Professor, K12, Teacher Education, Science Education, Media design, holo-lens, holographic, Augmented reality, Virtual Reality, Extended Reality, Holo lens, cyber learning, Instructional design, engineer education, postdoc, simulation, Addie methodology, MOOCs, distant education, LMS, Blackboard, NSF ICORP Launchpad accelerator, Technology transfer, Entrepreneur accelerator, NSF, Primary investigator, Project management, workforce training, holography, laser, author, publishing, chaos, 3D printing, volumetric, spatial reasoning, complex systems, semiconductors, remote teaching, PI, Director, educational technology, EdTech, Project management.

EDUCATION

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|------|---|-------------------------|
| 2012 | Ph.D. Physics | Kansas State University |
| | Dissertation: <i>Exploring Students' Patterns of Reasoning</i> | |
| | Advisor: Dr. Dean A. Zollman | |
| 2007 | M.S. Physics | Kansas State University |
| | Dissertation: <i>Physics Education Research into Practice</i> | |
| | Advisor: Dr. Dean A. Zollman | |
| 2003 | M.Sc. Astronomy Education | University of Glasgow |
| | (B.Sc. Solid State Physics, Shahid Beheshti University) | |
| | Dissertation: <i>Understanding & Accessibility in Physics</i> | |
| | Advisor: Dr. Norman Reid, Dr. Rex Whitedhead | |

EMPLOYMENT

Part-time Physics Lecturer, Chicago, State University, City Colleges of Chicago, starting 2022

Nov 2020-present Research Scientist Affiliate at SETI Institute

Project management and Research: serving as a PI or consultant on several pending grant proposals on Robotics Telescopes, Quantum Education, Teaching undergraduate physics and math with Emerging Technology. The grants were submitted to NSF and other funding agencies in collaboration with several universities and institutions including University of North Carolina, San Jose State University, San Francisco State University, zSapce Inc., Computer Science department at Columbia University, Lowell observatory. Funding requested in the range of: \$650,000-\$2000,000

July 2020-April 2021 Book Author

Visualizing Dynamic Systems: Volumetric and Holographic Display; Springer, Nature

Morgan Claypool Publishers merged with Springer Nature

http://www.morganclaypoolpublishers.com/catalog_Orig/product_info.php?products_id=1639

2019-2020 Research Scientist and consultant at Research Foundation SUNY and Lecturer Physics

As a research scientist at Research Foundation SUNY College of Nano Science and Engineering, I was granted 50%-course buyout for research on applied and industrial education. The deliverables included interactive models for industrial education emphasized the chemistry of Silicon microprocessors.

- Created online modules for Semiconductors Fabrication Processes
- Created a portal for industrial workforce and advance manufacturing
- Created a career map for advanced remodeled manufacturers evaluating the courses in mechatronics, semiconductors, sensors, mentored interns, developed Advance Manufacturing online materials using augmented, VR and holo-lens.
- Collected and evaluated existing courses and design missing courses
- Designed interactive courses for industrial workforce using gamifications
- Served as a search committee in hiring a nano science technical engineer
- Designed solutions for industrial training and Advance Manufacturing, Designing Augmented Reality Assets

2018-2020 Physics Lecturer and Media design for physics SUNY Polytechnic Institute, Dept, Math and Physics SUNY

- Served as a Faculty Fulltime Physics and Media design for visualization in physics
- Taught Introductory Physics for Life sciences

- Transformed traditional physics labs to PASCO Capstone and rewriting the lab manuals
- Served on the committee of submitting a physics major program
- Served on the Ad Hoc committee for physics success
- Submitted Internal and external Grant proposals such as IITG grant, SONY, IITG for SUNY, which is technology innovation grant, STTR and SBIR
- Completed NSF ICORPS training Launchpad and customer evaluation, LA node for STTR and SBIR grant proposal

2016-2018 Educational Designer and consultant at NYU and Adjunct Physics Lecturer at St. Francis College

- St. Francis College, Brooklyn, NY: Taught Intro physics lecture and labs, Vernier's labs
- New York University: Served as an Educational Designer, full-time project contract, developed Online Course for Physics, Chemistry (fully Online Asynchronous) & Astronomy (Hybrid, SCALE UP format)
- Developed simulations for astronomy along with student centered tutorials

2013-2016 Visiting Assistant Professor (Full time) Towson University, University of Hartford, Eastern Connecticut State University

- Designed and developed physics labs and lab manuals
- Lectured large physics lectures, using lecture demonstrations and clickers, (calculus-based physics)
- Developed introductory physics courses in the context of biology

2011- 2013 Lecturer Physics (Fulltime) California Polytechnic State University, San Louis Obispo, Winona State University, Full time lecturer

- Lectured large physics lectures, using lecture demonstrations and clickers (calculus-based physics)
- Lectured large Astronomy lectures, using lecture demonstrations and clickers (calculus-based physics) and peer instruction tutorials

2007-2011 Graduate Research Assistant, PhD Research Project
Physics Education Research Group, Kansas State University

2005 –2007 Graduate Research Assistant, MSc Research Project
Physics Education Research Group, KSU

2004 – 2005 Graduate Teaching Assistant, Physics Department, KSU

2002 – 2003 CHEVENING Scholar, Physics Department, University of Glasgow

2001& before: Holographic Optic lab experimentalist and manager

Developing security holograms and anti-counterfeit solutions in laser labs, Light Impression Ltd, and Sakhtiran Company Ltd.

Consultant Optics

Developing Instructional materials to train engineers, Fiber optics factory.

Science Museums & Informal Education

Developing Science museums and informal teaching (UNESCO, Zirakzade Foundation in collaboration with Exploratorium). Public high school teaching

Courses Taught and Developed:

Blended astronomy (NYU Faculty of Arts and Sciences)

Revamped the traditional lecture-based to a hybrid class along with student centered lecture tutorials. In collaboration with animation team and professor of the course created simulations for the abstract concepts such as parallax. The other features were digital studio lessons, online quizzes, and captivates lessons for interactivity.

Asynchronous course for Introductory Physics and Chemistry

Interactive online courses embedded with simulations, games and quiz

Calculus based Physics I and II: Lectured for non-majors in hybrid format including group problem solving incorporated with demonstrations and simulations integrated with problem solving and sequential questioning with clickers.

Laboratory Physics courses: Remodeled the traditional labs with PASCO sensors and developed a new inquiry-oriented lab manual.

Algebra based physics for biology majors: Redesigning algebra-based course incorporated project-based learning.

Advising Independent Studies-Undergraduate Mentorship: Capstone physics interdisciplinary projects as an independent study with the undergraduates.

Calculus-based Physics I & II: lectured in a blended format of group problem solving Lecture demonstrations, simulations. Discussions and, project based teaching were promoted and sequential questioning with clickers was implemented.

General Astronomy: Developed a hybrid course in astronomy with blended features of class discussions, simulations, online quizzes, projects, and Hubble deep field telescope inquiry-oriented activities, observations, and planetarium. Arranged for several observatory nights.

Advising Independent Studies-Undergraduate Mentorship: Conducting research experiment with undergraduates on optical set ups of imaging of the turbulent fluids. The sets of images were combined with various techniques for the investigation and analysis of vortices. To compare scalar fields of velocities, we compared the flames of various chemicals predicated the velocities of the ions of plasma based on the gradient of temperature.

General Physics II and Labs: I presented lessons in lecture demonstration format for non-majors algebra-based covering Electricity, Magnetism and Optics.

Re-designed General Physics II (Teaching in the context of biology): Redesigned the format content in order to be more relevant to biology majors. The alternated course was inquiry oriented, project based tailored to the needs of life science majors at Towson University.

Upgraded General Physics II Labs: I remodeled the labs by implementing interdisciplinary experiments.

Upgraded General Physics II Labs Manual: I revised and rewrote a new inquiry-oriented Physics lab manual for all the 12 series of experiments.

Advised Independent Studies-Undergraduate Mentorship:
I conducted capstone physics interdisciplinary research as an independent study.

Astronomy 101: Introductory astronomy for 75 non-majors covering descriptive astronomical properties of the Earth, Moon, other planets and their satellites; Comets, asteroids and other members of the Solar System, Theories of the formation of the Solar System, including telescope observations.
Clicker system for large classroom

Engineering Physics II: Lectures and recitations to engineers and physics majors, covering Waves, Optics and Thermodynamics, high level math content, 80 students divided in two sections, 3 hours lecture, 3 hours lab.
Clicker system for large classroom

Engineering Physics II Labs: I taught physics labs for engineers covering waves, Optics and Thermodynamics experiments, 75 students divided in Three sections, group problem solving, recitations

Engineering Physics III: I taught physics labs for engineers and physics majors, covering electricity and magnetism, group problem solving, problem solving with simulations, high-level math content, 40 students, 3 hours lecture, 3 hours lab

Engineering Physics III Labs: I taught physics labs covering electricity and magnetism experiments, 100 students divided in four sections

Advising Independent Studies-Undergraduate Mentorship: Capstone physics interdisciplinary research as an independent study

Engineering Physics: Lectures to engineers and physics majors, covering electricity and magnetism, high-level math content, 30 students, 3 hours lecture, 2 hours lab

Engineering Physics II Lab: Labs for engineers and physics majors, covering electricity, magnetism and optics experiments, group problem solving, recitations, simulation problem solving, 40 students divided in two sections, 2hours lab

Algebra Based Physics I labs: I taught labs to pre-med and biology majors covering experiments in mechanics

Algebra Based Physics II labs: I conducted labs for pre-med and biology majors covering experiments in electricity-magnetics, optics, thermodynamics, 50 students divided in three sections

Investigative Science: Courses in studio format with emphasis on methodology of teaching. The purpose of this course was to provide students with the tools to understand and apply the methods by which scientific inquiry increases our understanding of the natural world. Course offered for elementary majors, 30 students, 6 hours studio format class

Advising Independent Studies-Undergraduate Mentorship: Conducted capstone physics interdisciplinary research as an independent study

Courses Taught as a GTA at Kansas State University:

General Physics I

2009-2010

I taught recitation sections, 60 students divided in two sections, life science majors, 2 hours per weeks for each recitation, course covered Algebra-based physics in mechanics at conceptual level, my responsibilities in this course included:

Engineering Physics I&II Studios

2005-2010

I taught this courses in studio format to engineers and physics majors, 4 hours weekly. One Studio section, 20 students, calculus-based physics covering mechanics, waves, fluids, thermodynamics, electricity and magnetism, circuits, optics, and basic relativity principles electrostatics circuits, magnetism and optics. My responsibilities in this course included:

- Conducting studio sessions to integrate problem solving with experiments.
- Develop assessments to evaluate students conceptual, problem solving ability.
- Supervising a secondary teaching assistant in the Studio to assist me in teaching.

Descriptive Physics laboratory

2005-2006

I taught this courses in studio format to engineers and physics majors One laboratory section, 20 students, non-science majors, 4 hours weekly

Algebra-based course covering mechanics, heat, light, sound and atomic theory

My responsibilities in this course included:

- Facilitate student learning of the scientific method in experimental physics,
- Enable students to build skills of measurement, error analysis and estimation
- Design and score quizzes and exams, to assess student learning in the lab,
- Assume overall responsibility for assigning their course grades in this class.

RESEARCH

SETI Institute

2020-present

Primary investigator on proposal including quantum education for workforce, portable robotic telescopes, emerging technologies in teaching physics

SUNY Poly Technic

2018-2020

Applied and industrial education creating a porta for advanced manufacturing and online modules for Semiconductors Fabrication Processes, using emerging tech in scientific communication, completing NSF ICOPRP Launch pad for STTR and SBIR grants

Kansas State University-GRA

Inquiry Oriented Assessment Tool for Exploring Students' Reasoning

2007-2011

I developed a protocol for designing questions that elicits students reasoning. In addition, I developed a framework that classified sophistication of students' reasoning and compared students' responses across science disciplines.

Physics Education Research into Practice

2005-2007

In collaboration with Carnegie Mellon University and Kansas state university physics education research team, we created an online in-service (PATHWAY) professional development for K12 teachers. PATHWAY is an automated system that answers physics questions by providing a video response from the expert and a list of associated relevant articles to facilitate the communication between Physics Education Research communities and physics teachers.

University of Glasgow-Scholarship

Understanding and Accessibility in Physics

2002-2004

I was a recipient of CHEVENING scholarship to develop self-diagnostic tests in geometrical astronomy and special relativity. The study served as a pilot to evaluate the feasibility of automating self-paced learning in astronomy education. The idea emerged from our study was an automated assessment tool that was self-paced and self-diagnostic.

Grants Submitted

1. Matloob Haghanikar(PI), NSF (AISL), eVscopes for STEM, EXO-BLAST submitted 1/11/2022, \$2.7 million Status pending
2. Matloob Haghanikar(PI), Columbia University, Kansas State University and SFSU, Vector Calculus with XR, NSF (RETTL), submitted Oct, 18th, 2021, \$850 K, Status pending.
3. Matloob Haghanikar(PI), UNC, zSapce, SpectrumRED, Teaching physics with AR, IES, submitted 9/2021, \$2 million status pending.
4. Matloob Haghanikar(PI), UAlbany, SJSU and UNC, Quantum Information Education, NSF IUSE, submitted 7/2021, status pending.
5. Matloob Haghanikar(PI), NSF (AISL), eVscopes for STEM, submitted 1/13/2021, Status: not funded.
6. Matloob Haghanikar(PI), Fotso Herbert, David Pape (Media Design, UB), Augmented reality Curriculum design, (IITG, 20K) submitted 2020, budgets redistributed due to COVID.
7. Matloob Haghanikar (PI), Xie, Yubing, Fotso Herbert, VISTA LINKS SCIENCE LABS, NSF, ICOPRS, accepted.
8. Matloob Haghanikar (PI), Augmented and Virtual reality Curriculum design (SONY, 100K), submitted 2018, Not funded.
9. Matloob Haghanikar(PI), Xie, Yubing, Fotso Herbert, Charles, Nicholas Lejuene, Augmented and Virtual reality Curriculum design, (IITG, 90K) submitted 2019, Finalist, Not funded.
10. Matloob Haghanikar (PI), Xie, Yubing, Fotso Herbert, Charles, Nicholas Lejuene, Using AR as a new tool for scientific communication (submitted 2019, SEED Grants, 25 k, not selected)
11. Matloob Haghanikar, T., Matloob Haghanikar (PI), M., Wang, L., & Zhang, G. (2017, May 5). Narrative medicine meets virtual reality (VR). Publicis health and NYC media lab. Grant for emerging media and technology startup concepts developed by university faculty and students. (\$5,000). Finalist but not selected.

Featured

Interview SETI Institute, Facebook Live session about my recent book: Visualizing Dynamic Systems with Morgan and Claypool Publishers

SETI Live: How to Better Visualize Complex Systems?

Interview SETI Institute Special Fire Chat Live session May 30th

Introduced the activities of SETI Institute Department of Education and my involvement

Nature Volve, ISSUE June 2020

I was interviewed about the designs I developed. I explained the characteristics of developing and marketing cyberlearning education in general and specially in the time of Covid 19 and beyond.

PUBLICATIONS

1. Haghanikar, M., M. (2021), Visualizing Dynamic Systems: Volumetric and Holographic Display, Morgan and Claypool Publishers, DOI:
<https://www.morganclaypool.com/doi/abs/10.2200/S01092ED1V01Y202104EST015>
 - a. http://www.morganclaypoolpublishers.com/catalog_Orig/product_info.php?products_id=1639.
2. Matloob Haghanikar, M. (2019). Cyberlearning and Augmented Reality in STEM Education, IEEE, Games, Entertainment, Media Conference, IEEE, GEM Proceeding June 2019.
3. Matloob Haghanikar, M. (2012). Exploring Students' Patterns of Reasoning (Doctoral dissertation, Kansas State University, Department of Physics) Available online:
<http://perg.phys.ksu.edu/dissert.html>.
4. Haghanikar, M. M., Murphy, S., Zollman, D., Rebello, N. S., Engelhardt, P. V., & Singh, C. (2012). Evidence of students' content reasoning in relation to measure of reform.
<https://doi.org/10.1063/1.3680047>
5. Matloob Haghanikar, M. (2007). Physics Education Research into Practice. (Master dissertation, Kansas state university, Department of Physics).
6. Matloob Haghanikar, M. (2003). Understanding and Accessibility in Physics. (Master dissertation, University of Glasgow, Centre for Science Education).
7. "Students' Reasoning and the Level of Interactivity in Science Content Courses for Future Elementary Teachers, National Association for Research in Science Teaching Annual Meeting, March 28, 2012 Indianapolis.
8. "Modeling Students' Reasoning and the Level of Interactivity in Science Content Courses for Future Elementary Teachers", Mojgan Matloob Haghanikar, Dean Zollman under review to be published.
9. "How the sophistication level of students' conceptual structure relates to the features of instruction?" Mojgan Matloob Haghanikar, Dean Zollman, under review to be published.
10. "Investigating the relation between students' reasoning and the pedagogy in university science content courses for future grade 1-6 teachers", Dean Zollman, Kansas State

University, USA, Mojgan Matloob-Haghanikar, Winona State University, USA, World Conference Physics Education, GIREP (2011), Istanbul, Turkey.

11. "Evidence of Students' Content Reasoning in Relation to Measure of Reform" Mojgan Matloob Haghanikar, Sytil Murphy and Dean A. Zollman, PERC Proceeding 2011.
12. "Assessing Students' Reasoning across Disciplines in Entry-Level Science Courses" Mojgan Matloob Haghanikar, Sytil Murphy and Dean A. Zollman, National Association for Research in Science Teaching Annual Meeting, April 3-6, 2011 Orlando, FL.
13. "Point of View: How Are We Reforming Teaching in Undergraduate Science Sources?" Cynthia Szymanski Sunal, Dennis Wayne Sunal, Cheryl Sundberg, Cheryl Mason, Dean Zollman, Corrine Lardy, and Matloob-Haghanikar Mojgan, Journal of College Science Teaching, 39 No. 2 Nov. 2009.
14. Sunal, D., Sunal, C., Turner, D., Steele, E., Mason, C., Lardy, C., Zollman, D., Matloob-Haghanikar, M., & Murphy, S. (2014). National Study of Education in Undergraduate Science: Research Design. In Sunal, D., Sunal, C. & Wright, E., Mason, C., and Zollman, D. (Eds.), Research based undergraduate science teaching Charlotte, N.C.: Information Age Pub.

INTERNAL DOCUMENTS

1. "Students' Reasoning and the Level of Interactivity in Science Content Courses", Dean A Zollman, Kansas State University, Mojgan Matloob-Haghanikar, California, Polytechnic University at San Luis Obispo and Sytil Murphy, Shepherd University, (www.nseus.org).
2. "What Perceptions of Undergraduate Science Teaching Do Students in Reform and Non-Reform Science Courses Describe?," Dennis W. Sunal, Cynthia Szymanski Sunal, Erika Steele, Donna Turner, Cheryl L. Mason, Corrinne Lardy, Dean Zollman, Mojgan Matloob-Haghanikar, and Sytil Murphy(www.nseus.org).
3. "What Perceptions of Scientists Do Undergraduate Students in Reform and Non-Reform Science Courses Describe?," Cynthia Szymanski Sunal, Dennis W. Sunal, Donna Turner, Erika Steele, Cheryl L. Mason, Corrine Lardy, Dean Zollman, Mojgan Matloob-Haghanikar, and Sytil Murphy(www.nseus.org).
4. "What Characteristics Are Identified as Key Reform Components Among a Sample of Reformed Undergraduate Science Courses? ," Dennis W. Sunal, Cynthia Szymanski Sunal, Erika Steele, Donna Turner, Cheryl L. Mason, Corrine Lardy, Dean Zollman, Mojgan Matloob-Haghanikar, and Sytil Murphy(www.nseus.org).
5. "What Characteristics Are Found in Reformed and Non-Reformed Undergraduate Science Courses?," Dennis W. Sunal, Cynthia Szymanski Sunal, Cheryl Sundberg, Cheryl L. Mason, Corinne Lardy, Dean Zollman and Mojgan Matloob-Haghanikar, (www.nseus.org).

CONTRIBUTED PAPERS & Invited Colloquium

1. Speaker, Cyberlearning and Augmented Reality in Scientific Communication, Union College, Virtual Colloquium due to the Pandemic, April, 2020.
2. Speaker, Cyberlearning and Augmented Reality in STEM Education, IEEE (GEM), Games, Entertainment, Media Conference, June 19-22, 2019, Yale University.
3. Speaker, Using Volumetric and Holographic Display in Visualizing Dynamics of Scientific

- Interactions, Conference of Instructional Technology, May 28-31st, 2019, Purchase College, NY.
4. Speaker, Teaching with Augmented Reality: Connecting Microscopic and Macroscopic Features New York State Section of American Association of Physics Teachers (NYSS- AAPT), spring meeting, April 27th, Mohawk Valley Community College, Utica, NY.
5. Invited Speaker, Using Volumetric and Holographic Display in Visualizing Dynamics of Scientific Interactions American Association of Physics Teachers (AAPT), Provo, Utah, summer 2019.
6. Invited Colloquium: Holographic platform for Scientific Communication, Implementing AR to Nano science courses, Mojgan Matloob Haghanikar, SUNY Polytechnic Institute, November 2018.
7. Presentation: "Integrated Physics" Mojgan Matloob Haghanikar, Harvard University, Cambridge, MA, August (2017).
8. Invited Colloquium "The Art of Thinking about Complex Systems" Mojgan Matloob Haghanikar, Columbia University, Barnard College, NYC, NY, October (2017).
<https://www.youtube.com/watch?v=VK3JBdD3wb0>.
9. "Spatial Thinking in Physics and Augmented Reality" Mojgan Matloob Haghanikar, AAPT Regional Meeting, Syracuse University, Syracuse NY Sep (2017).
10. Presentation: "Assessment of Analytic Reasoning for Integrative Studies" Mojgan Matloob Haghanikar, MSU, Michigan, August (2016).
11. "Project Based Teaching" Mojgan Matloob Haghanikar, AAPT Winter Meeting, California, San Diego (2015).
12. "Students' Reasoning and the Level of Interactivity in Science Content Courses" Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman National Study of Education in Undergraduate Science (NSEUS): National Conference, Tuscaloosa, Alabama, May 2012.
13. "Students' Reasoning and the Level of Interactivity in Science Courses for Future Elementary Teachers" Dean Zollman, Mojgan Matloob Haghanikar and Sytil Murphy Zollman, National Association for Research in Science Teaching Annual Meeting, March 25-28, 2012, Indianapolis, Indiana.
14. "Evidence of Students' Content Reasoning in Relation to Measure of Reform" Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman National Study of Education in Undergraduate Science (NSEUS): National Conference, Tuscaloosa, Alabama, June 2011.
15. "How Students' Conceptual Structure Relates to their Sophistication of Reasoning", Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman, AAPT Summer Meeting, Omaha, 2011.
16. "Assessing Students' Reasoning across Disciplines in Entry-Level Science Courses" Mojgan Matloob Haghanikar, Sytil Murphy and Dean A. Zollman, National Association for Research in Science Teaching Annual Meeting, April 3-6, 2011 Orlando, FL.
17. "A Protocol for Classifying Sophistication of Students' Reasoning" Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman, AAPT Winter Meeting, Florida, Jacksonville (2011).
18. "Using a Backward Design Process in Evaluating Students' Reasoning," Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman, AAPT Summer Meeting, Portland, Oregon (2010)
19. "Exploring Students' Patterns of Reasoning," Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman, AAPT Winter Meeting, Washington, DC (2010).
20. "Reform in Entry-Level Undergraduate Science Coursework: Impacts on Pre- and In-Service K-6 Teachers in a National Sample," Dennis Sunal, Cynthia Sunal, Cheryl Mason, Dean Zollman, , Corrine Lardy, Steele, E., Turner, D., Matloob-Haghanikar, M., & Murphy, S. National Association for Research in Science Teaching. Philadelphia, PA, (2010).
21. "Protocol for Analysis of Content Questions," Mojgan Matloob Haghanikar, Sytil Murphy & Dean Zollman, , Arkansas-Oklahoma-Kansas Section Meeting of the AAPT, Manhattan, KS (2009).
22. "Exploring Students' Patterns of Reasoning," Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman, AAPT Summer Meeting, Ann Arbor, MI (2009).

23. "Study on How College Science Courses Influence Elementary School Teachers' In-service and Pre-service Teacher Preparation," Sytil Murphy, Mojgan Matloob Haghanikar and Dean A. Zollman, AAPT Summer Meeting, Ann Arbor, MI (2009).
24. "Exploring Students' Patterns of Reasoning," Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman, AOK Section Meeting of the AAPT, Midwest City, OK (2008).
25. "Bringing Relevant Physics Education Research to High School Physics Teachers," Mojgan Matloob-Haghanikar, Brian Adrian and Dean Zollman, AAPT Summer Meeting, Greensboro, NC (2007).
26. "Investigating the Application of Concepts by Future K-6 Teachers in Traditional and Reform Science Courses," Mojgan Matloob-Haghanikar, Dean Zollman, Cheryl Mason, Dennis Sunal and Cynthia Sunal, A-O-K Section Meeting of the AAPT, Conway, AR (2007).
27. "How Pathway Helps Teachers Bring Physics Education Research into Practice," Mojgan Matloob, Brian Adrian & Dean Zollman, A-O-K Section Meeting of the AAPT, Emporia, KS (2006).

CONTRIBUTED & INVITED POSTERS

1. "Interdisciplinary Capstone Projects" Mojgan Matloob Haghanikar, AAPT Regional Meeting, Syracuse University, Syracuse, NY, Sep (2017).
2. "Introducing a method for classifying students' conceptual structure" Mojgan Matloob Haghanikar, AAPT summer Meeting, College Park, Maryland, 2015.
3. "Using interdisciplinary projects in teaching General Physics Courses" Mojgan Matloob Haghanikar, AAPT Winter Meeting, Florida, Orlando (2014).
4. "Investigating the Relation between Students' Reasoning and the Pedagogy in University Science Content Courses for Future Grades 1-6 Teachers", Dean Zollman and Mojgan Matloob Haghanikar, World Conference on Physics Education, July 1-6, Istanbul, Turkey, (2012)<http://web.phys.ksu.edu/posters/2012/zollman-NSEUS-WCPE.pdf>
5. "Do students Reason Better in Interactive Courses?" Mojgan Matloob Haghanikar, Sytil Murphy and Dean Zollman, AAPT Summer Meeting, Omaha, 2011.
6. "A Method for Classifying Conceptual Structure" Mojgan Matloob Haghanikar, Sytil Murphy and Dean A. Zollman, AAPT Winter Meeting, Florida Jacksonville (2011)
7. "A Protocol for Evaluating Meaningful Understanding," Mojgan Matloob Haghanikar, Sytil Murphy and Dean A. Zollman, AAPT Summer Meeting, Portland (2010).
8. "An Inquiry Oriented Assessment Tool for Exploring Students' Reasoning," Mojgan Matloob Haghanikar, Sytil Murphy and Dean A. Zollman, Physics Education Research Conference Portland (2010).
9. "A Protocol for Exploring Students' Reasoning," Mojgan Matloob Haghanikar, Sytil Murphy and Dean A. Zollman, Physics Education Research Conference Meeting, Ann Arbor, MI (2009).

INVITED POSTER

"Assessments that Analyze Students' Reasoning on Written Exam Questions" Mojgan Matloob Haghanikar, Sytil Murphy and Dean A. Zollman, Physics Education Research Conference Meeting, Omaha, Nebraska, 2011.

Conferences attended without paper

AAS (American Astronomical Society), Jan 2021, Virtual Conference.

AWE (Augmented Reality World Expo), 2018, Santa Clara, California, 2018.

Apereo Conference, Open Apereo 2016, NYU NYC.

Ed Tech Conference, 2017, NYU, NYC.

The Immersive Story Telling Symposium, Parson New school, Feb 2017, NYC.

NYC Media Lab 2016.

AWARDS

1. Individual Development Award UUP, \$1000, SUNY Polytechnic Institute, 2019.
2. *Chevening Scholarship* (\$20,000)– University of Glasgow (2002).
3. *PERLOC*- AAPT winter meeting \$800, (2010).

FUNDING

1. *UNESCO* – Physics Education Conference, Italy, GIREP (2001)
2. *UNESCO*- Developing Science Exhibition (2001)
3. *British Council*- Developing travelling Science Exhibition
4. *University of Isfahan*- Developing travelling Science Exhibition (2000)
5. *Private Organization funds*- Developing Science Museum (1999)

PROFESSIONAL ASSOCIATIONS

1. American Astronomical Society (AAS)
2. American Association of Physics Teachers (AAPT)
3. National Association for Research in Science Teaching (NARST)

CERTIFICATES and WORKSHOPS

1. NSF ICORP Launchpad accelerator, Technology Entrepreneur accelerator, Innovation Node, IN-LA.
2. Motion Capture Intensive, IEEE, GEM (Games Entertainment Media), Yale U, June 2019.
3. Quantum Information, SUNY Poly Technic, Utica, NY, July 2019.
4. Virtual Reality and Unity, Circuit Stream Workshops, AWE, Santa Clara, CA, 2018.
5. Unity, Magnet, Tandon School of Engineering, NYU, Brooklyn, NY, Jan, 2018.
6. Certificate of Completion of Writing and Designing NSF Proposal Workshop, Held at University of Maryland-College Park, (2014).
7. NEXUS workshop for teaching physics in the context of biology, AAPT summer meeting Maryland (2015).
8. Python, AAPT winter meeting, San Diego (2015)
9. Astronomical Inquiry, AAPT winter meeting, San Diego (2015)
10. Java Script AAPT winter meeting, San Diego (2015)
11. Certificate of Holography Imaging Light Impression Ltd, UK, (1995).

SKILLS

Technical skills for teaching service and research

1. Course design; Sakai, Canvas, Moodle and Blackboard, Captivate
2. Fluent in Google Drive and Google Sheets, Python
3. Endnote and other educational related software.

4. Image J and video tracking in biology and astronomy
5. Planetarium and astronomical simulations such as star gazing
6. Capstone Software of PASCO Scientific
7. Glass technology for Flip classroom

SERVICE

1. REU applications review, SETI, Institute, 2022
2. Curriculum Committee SUNYPOLY, selected member, 2020.
3. Search Committee for hiring an Practical Engineer, SUNY PolyTechnic (2019).
4. Committee for Initiating Physic program at SUNY PolyTechnic (2018).
5. Committee for Initiating a MS Program in Data Science at SUNY PolyTechnic (2018).
6. Adhoc committee of Physics success, SUNYPOLY, (2018).
7. Initiating Physics club Youtube, SUNYPOLY (2018).
8. Outreach: Advising highschool prospect students interested in teaching physics and physics education, SUNY PolyTechnic (2018).
9. Curriculum reform and project based teaching (2011-2020).
10. Assisting planetarium shows, Towson University (2014).
11. Arranging Telescopes and observatory nights, University of Hartford (2015).
12. Curriculum reform, Eastern CT State University (Summer 2015).
13. Undergraduate Mentoring (2011-2020).
14. Girls Research Our World (GROW) Workshop, Kansas State University (Summer, 2010).
15. Providing support for in-service teachers, Winona State University (2011).
16. Building communities, self sustainable living, Winona State University (2011).
17. Lecture demonstrations Calpoly (2013), Towson University (2014), U Hartford (2015).
18. Telescope observatory, Sun spots, Calpoly, 2013.