

Connecting Physics Bachelors to Their Dream Jobs



AIP Career Pathways Project

Shouvik Bhattacharya

08.07.2012



Who I am

- A rising senior at Minnesota State University, Moorhead
- BS in Physics (emphasis in Astronomy) and BA in Mathematics
- Interests include stellar spectroscopy, observational cosmology, computational astrophysics, job search and networking

Outline

- About Career Pathways Project
- Features identified in department visit reports
- Developing an outline for a career workshop
- Working with a professional writer on my resume
- Attending a job fair
- Some tips on networking
- Project outcome

About Career Pathways Project

“Physics is often perceived as an academic major with no direct path to a job, nor any direct application to society, despite its high job placement rate and direct application to energy, medicine, computer hardware and software, and many areas of vital concern” (The NSF grant proposal, Olsen, Redmond and Czujko).

Common Department Features

- Research experience-on or off campus
- Faculty commitment to students
- Strong student community
- Multiple tracks or curricular flexibility
- University Career Development Office
- Lab experiences-courses
- Exceptional staff member
- Recruitment of majors
- Physics seminars on careers
- External advisory committee
- Active outreach activities
- Relationship with alumni

Self-assessment exercise for a Career Workshop

- Lab experience
- Programming
- Complex Problem Solving
- Advanced Mathematics
- Communication
- 21st Century Skills

Resume-then

Shouvik Kanti Bhattacharya

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EDUCATION Bachelor of Science in **Physics, emphasis in Astronomy** Expected May 2013
Bachelor of Arts in **Mathematics**
Minnesota State University Moorhead (MSUM), Moorhead, MN

RELATED EXPERIENCE

Undergraduate Research Assistant at MSUM Spring 2010-Spring 2012

- Conducted photometric and spectroscopic study of variable stars

Teaching Assistant Introductory Astronomy Courses at MSUM Spring 2010-Spring 2012

- Answered student questions during the lecture and lab sessions
- Tutored and helped students with homework questions
- Taught students and assessed grades in regard to the names and positions of stars and constellations during observation project at planetarium

OBSERVATIONAL ASTRONOMY

- Administered the calibration of the SBIG SGS 2.0 spectrograph
- Conducted CCD photometry of the RR Lyrae (XX Cyg) stars and the eclipsing binary stars
- Documented the changing focus of Apogee Alta CCD camera with temperature
- Generated a light curve of the XX Cyg using MaxIM DL software
- Tested the quality of data reduction using various types of image processing software
- Wrote a feasibility study report on using the most efficient image processing software

AWARDS/HONORS

- **Department of Physics and Astronomy Scholarship** at MSUM, Spring 2012, Spring 2011
- **Walter Worman Scholarship** for emphasis in Astronomy at MSUM, Spring 2012, Spring 2010
- **TSP Scholarship** for outreach activities by Department of Mathematics at MSUM, Spring 2012
- Inducted to **The Physics Honor Society, Sigma Pi Sigma**, Spring 2011
- **Dean's grant** for spectroscopy of variable stars research from the **College of Social and Natural Sciences**, at MSUM, Spring 2011

COMPUTER SKILLS Microsoft Office, Maple, Mathematica, IRIS, and Python (Novice)

PRESENTATIONS

- Gave a talk on "Astronomical Observations of RR Lyrae Stars" at the Student Academic conference (SAC) at MSUM, Spring 2012
- Participated in a group lecture on "Mathematical Model of Throwing a Baseball" at the SAC at MSUM and at MN Conference of Undergraduate Scholarly and Creative activity at Minnesota State University Mankato, Spring 2012
- Presented a poster on "Photometric Observations Conducted at Paul P Feder Observatory" at the SAC at MSUM and at MN Conference of Undergraduate Scholarly and Creative activity at Minnesota State University Mankato, Spring 2012
- Lectured on "Space age and India" in the International Student Academic Week, MSUM, Fall 2010
- Presented two posters at the SAC at MSUM, on superconductivity (Determining the transition temperatures of a High-Tc superconducting sample by measuring its inductance) and energy efficient house (Design of An Energy-efficient House: From construction phase through livable stage) respectively, Spring 2010

EXTRACURRICULAR

- International Student Diplomat, International Student Services (ISS) at MSUM, Spring 2010-present
- Vice President of the SPS (Society of Physics Students) at MSUM, Academic year 2012-13

Resume-now

Shouvik Bhattacharya

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Research & Lab Assistance

Observational Cosmology • Mathematical Physics • Astrophysics

- Dedicated to the highest levels of scientific discovery, laboratory safety, and academic success.
- Known for leveraging work ethic and critical thinking skills to provide exceptional support to professors and scholars.
- Adept at calibrating instruments and troubleshooting technical problems.
- Proficient in generating feasibility studies, quality tests, and mathematical models.
- Skilled in making astronomical observations through photometry and spectroscopy.
- Experienced in developing workshops, meetings, research strategies, and data tracking/reporting tools.
- Outstanding communication, planning, and collaboration skills; fluent in English and Bengali.

Education

MINNESOTA STATE UNIVERSITY MOORHEAD (MSUM), Moorhead, MN

Bachelor of Science in Physics, Emphasis in Astronomy
Bachelor of Arts in Mathematics

Expected May 2013
Expected May 2013

Relevant Experience

AMERICAN INSTITUTE OF PHYSICS, College Park, MD

SPS Summer Intern, Career Pathways Project | 06/2012 to Present: Develop a highly effective career workshop for physics majors and compile job search materials. Expand professional network through job fair participation; collaborate with high-ranking academics. Arrange meetings to determine best strategies, practices, and priorities. Design spreadsheets to better track reports of university physics departments from across the nation. Work to establish alumni network throughout physics departments. Produce website to prepare students for job searches.

MINNESOTA STATE UNIVERSITY MOORHEAD, Moorhead, MN

Teaching Assistant | 01/2010 to 05/2012, 08/2012 to Present: Leverage exceptional communication skills to improve student performance in the Department of Physics and Astronomy. Provide comprehensive support for introductory astronomy and analog electronics courses. Tutor students and answer questions during lectures and lab sessions. Instruct students, assess grades, and assist with observation projects at the planetarium and the Paul P. Feder Observatory.

Undergraduate Research Assistant | 01/2010 to 05/2012: Completed photometric and spectroscopic studies of variable stars, RR Lyrae (SZ Lyn and XX Cyg) and eclipsing binaries (RZ Com). Made observations on campus at the Paul P. Feder Observatory. Calibrated SBIG SGS 7.0 spectrograph, generated a light curve of the XX Cyg, and documented the changing focus of Apogee Alta CCD camera with temperature. Tested data reduction techniques of RR Lyrae star images. Prepared feasibility study on efficient image processing methods using Astromodel, MaxIM, DL, and IRIS software.

Student Volunteer | 07/2011: Helped children build complex circuits and BOTS during a summer workshop.

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Academic Honors

SPS National Leadership Scholarship	2012
TSP Scholarship, Department of Mathematics at MSUM	2012
Department of Physics and Astronomy Scholarships at MSUM	2011 / 2012
Walter Woman Scholarships at MSUM	2010 / 2012
Sigma Pi Sigma Physics Honor Society Induction	2011
Dean's Grant for "Spectroscopy of Variable Stars," College of Social and Natural Sciences at MSUM	2011

Presentations

- S. Bhattacharya: "Astronomical Observations of RR Lyrae Stars." Student Academic Conference (SAC) at MSUM. Spring 2012.
- S. Bhattacharya, N. Anderson, and Z. Morseth: "Mathematical Model of Throwing a Baseball." SAC at MSUM and MN Conference of Undergraduate Scholarly and Creative Activity at Minnesota State University — Mankato. Spring 2012.
- S. Bhattacharya, H. Johnson, and T. Lane: "Photometric Observations Conducted at Paul P. Feder Observatory." SAC at MSUM and MN Conference of Undergraduate Scholarly and Creative Activity at Minnesota State University — Mankato. Spring 2012.
- S. Bhattacharya: "Space Age and India." International Student Academic Week. MSUM. Fall 2010.
- S. Bhattacharya, M. Saajin: "Superconductivity: Determining the Transition Temperatures of a High-T_c Superconducting Sample by Measuring its Inductance." SAC at MSUM. Spring 2010.
- S. Bhattacharya: "Design of an Energy-Efficient House: From Construction Phase Through Livable Stage." SAC at MSUM. Spring 2010.

Affiliations

AMERICAN PHYSICAL SOCIETY (APS)
Member | 2009 to Present

INTERNATIONAL STUDENT SERVICES (ISS) AT MSUM

International Student Diplomat | 2010 to Present: Answer new student questions about campus, courses, and city.

SOCIETY OF PHYSICS STUDENTS (SPS)

Member / Vice President | 2011 to Present: Led MSUM chapter participation in the university physics challenge and the MCM competition.

AMERICAN ASTRONOMICAL SOCIETY (AAS)

Member | 2012 to Present

Technical

Microsoft Office, Maple, Mathematics, IRIS, MaxIM, DL, and Python.

Additional

Edited scientific diagrams and illustration data for a 7th Grade textbook.

Job fairs

- Job fair preparation (What to research)
- Spend sometime on your resume
- Wear professional clothes
- Take time to answer questions
- Networking

Online Networking

- Set up a LinkedIn account.
- Join groups that interest you most.
- Twitter limits your thoughts in 140 characters.
- Do not post random tweet updates, especially which do not tell much about your professional life.

Project outcome

- Learned a great deal about writing and publishing.
- Composed department feature report that will be used in future department visits by the Career Pathways project team.
- Prepared an eight-page technical report and a four-page informal report on attending a job fair.
- Shared thoughts on Career Using Physics website for the SPS. <http://www.spsnational.org/cup/>
- Initiated working on Career Pathways Project poster which will be displayed at the Physics Congress, 2012.

Thank you

- Thomas Olsen
- Kendra Redmond
- Roman Czujko
- Gary White
- Toni Sauncy
- Elizabeth Hook
- Tracy Schwab
- Bonnie Feldman
- Justin Stewart
- Sacha Durham- Purnell
- Lydia Quijada

This work was supported in part by a grant from the National Science Foundation, “Expanding the STEM Workforce by Equipping Physics Bachelors Degree Recipients and their Departments to Address the Full Range of Career Options”.