ANUPRIYA JAYAKUMAR
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VISA STATUS: Permanent Resident (No VISA sponsorship required).

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WORK EXPERIENCE

Post-Doctoral Research Associate, Aug 2012-Dec 2014
Prof. Boris Blinov
University of Washington, Seattle, WA

Stay at home mom, Jan 2015- Present

EDUCATIONAL QUALIFICATIONS

Ph.D. (Physics), 2007−2012
Prof. M. Pattabiraman
Indian Institute of Technology Madras, Chennai, India

M.S (Physics), 2005−2007; **Gold medalist, First rank in Department of Physics**
Presidency College (Madras University), Chennai, India

B.S (Physics), 2002−2005; **Gold medalist, First rank in Department of Physics**
Meenakshi College for Women (Madras University), Chennai, India

SCIENTIFIC SKILLS

Data Analysis | Saturation absorption spectroscopy (SAS) | Extended cavity diode laser construction | Built Two-channel acousto optic modulator (AOM) driver box | A-B differential amplifier circuit design and construction | Soldering | Mathematical Modelling | Machining | Optical alignment | Fiber optics coupling | UHV vacuum techniques | IGOR | Origin | Inkscape | LaTex |

PROGRAMMING SKILLS

R | Matlab/Octave | MYSQL | Python | Mathematica | HTML/CSS | Microsoft office (WORD, EXCEL, POWERPOINT) |

RESEARCH EXPERIENCE

2012−2014 Department of Physics, University of Washington, Seattle, Washington, USA

Ba ion spectroscopy – Precision Spectroscopy lab (Dr. Boris Blinov)

- Polarization rotation measurement of the $6S_{1/2} \leftrightarrow 5D_{3/2}$ magnetic dipole transition moment *M1*, in Ba^{+}: The aim of this study was to make a precise measurement of M1 as this turns out to be the leading systematic error in parity nonconservation (PNC) measurement. This measurement is

therefore an essential step toward a PNC experiment in the ion that will also test the current many-body theory.

- Stress induced birefringence: Explored the effect of the stress induced birefringence across the silica viewports on the 2051 nm beam polarization using crossed polarizer arrangement. Precise control of the beam polarization is a general concern in trapped ion PNC measurement. Characterized the corresponding optical axis orientation and the phase retardation associated with it using the Jones matrix formalism. The data was analyzed using Origin software.

Yb atom spectroscopy – Ultra cold atoms and molecules (Dr. Subhadeep Gupta)

- Dual-axis Ytterbium (Yb) vapor cell for simultaneous laser frequency stabilization on disparate optical transitions: Constructed and developed a dual-axis Ytterbium (Yb) vapor cell to simultaneously address the two laser cooling transitions in Yb at wavelengths 399 nm and 556 nm, thereby enabling the simultaneous observation of saturated absorption spectroscopy for both these transitions and demonstrated stabilized laser frequency over a full day. This finds applications in laser cooling experiments.

2007–2012 Department of Physics, Indian Institute of Technology Madras, Chennai, India (Dr. M. Pattabiraman)

- The influence of the Laguerre Gaussian (LG) beam on the atomic coherence and the associated spectroscopic phenomena like nonlinear magneto optical rotation (NMOR), Hanle electromagnetically induced transparency (EIT) and electromagnetically induced absorption (EIA) was not well known previously. My graduate thesis preliminarily focused on the interaction of the Rubidium (Rb) atoms with a coherent LG optical field with spatially varying phase factor and mode amplitude. Designed and executed the detailed computational and experimental studies to understand the effect of the LG field on the Zeeman coherences arising as a result of such an atom-field interaction.

- For more information on the experimental and computational details, results/summary and applications:
  https://priyakalyan.github.io/Docs/Thesis_Anupriya.pdf

- Collaborated and worked at premier research institutes like IISc (Indian institute of science, Bangalore, India) and RRI (Raman Research institute, Bangalore, India) with the construction of an A-B differential amplifier circuit and extended cavity diode laser (ECDL) to perform the above mentioned experimental studies.

CERTIFIED COURSES

https://priyakalyan.github.io/Courses.html

PUBLICATIONS

- Spencer R. Williams, **Anupriya Jayakumar**, Matthew R. Hoffman, Boris B. Blinov, E.N. Fortson, "An Upper Bound on the Strongly Forbidden 6S1/2↔5D3/2 Magnetic Dipole Transition Moment in Ba^{+}", ***Asian Journal of Physics,* 26** 09-19 (2017).
- **Anupriya Jayakumar**, Ben Plotkin-Swing, Alan Jamison and Subhadeep Gupta, "Dual-axis Vapor Cell for Simultaneous Laser Frequency Stabilization on Disparate Optical Transitions", ***Review of scientific instruments***, **86**, 073115 (2015).

- Spencer R. Williams, **Anupriya Jayakumar**, Matthew R. Hoffman, Boris B. Blinov and E. N. Fortson**,** "Method for measuring the $6S_{1/2} \leftrightarrow 5D_{3/2}$ magnetic-dipole-transition moment In Ba^{+} ", ***Phys. Rev. A***, **88**, 012515 (2013).
- Matthew R. Hoffman, Thomas W. Noel, Carolyn Auchter, **Anupriya Jayakumar**, Spencer R. Williams, Boris B. Blinov and E. N. Fortson**,** "Radio frequency spectroscopy measurement of the Landé *g* factor of the $5D_{5/2}$ state of Ba II with a single trapped ion", ***Phys. Rev. A***, **88**, 025401 (2013)
- **J. Anupriya**, Nibedita Ram and M. Pattabiraman**,** "Hanle electromagnetically Induced transparency and absorption resonances with a Laguerre Gaussian Beam", ***Phys. Rev. A***, **81**, 043804 – 043806 (2010).
- Nibedita Ram, **J. Anupriya**, M. Pattabiraman and C. Vijayan, "Role of transfer of coherence in enhanced absorption Hanle effect with two optical fields", ***J. Phys. B: At. Mol. Opt. Phys***, **42**, 175504 – 175510 (2009).

CONFERENCES

- 15th Annual Meeting of the APS Northwest Section, University of Washington, Seattle, WA, **"Progress toward measuring the $6S_{1/2} \leftrightarrow 5D_{3/2}$ strongly forbidden Magnetic dipole transition moment in Ba^{+}"** May 1-3, 2014.
- 44th Annual Division of Atomic Molecular and Optical Physics (DAMOP) meeting, Quebec city convention center, Quebec City, Quebec, Canada **"Proposal for parity nonconservation measurements in a single trapped Ba ion"** June 3-7, 2013
- Third international conference on "Current Developments in Atomic, Molecular, Optics and Nano Physics", University of Delhi, New Delhi, India **"Hanle electromagnetically Induced transparency and absorption resonances with a Laguerre Gaussian Beam."** December 14-16, 2011
- Tropical conference on Interaction of Electromagnetic Radiation with Atoms, Molecules And Clusters, Raja Ramanna Centre for Advanced Research (RRCAT), Indore, India **"Role of transfer of coherence in enhanced absorption Hanle effect with two optical fields."** March 3-6, 2010
- DAE-BRNS symposium on Atomic, Molecular and Optical Physics, Inter University Accelerator centre, New Delhi, India, **"Study of Laguerre Gaussian beam induced azimuthal Doppler shift using saturation absorption spectroscopy**." February 10-13, 2009

OTHER EXPERIENCES

- Helped in writing the grant for the parity non-conservation experiment proposal.
- Worked as an instructor for the summer quarter 2014 for the course "Introductory mechanics" at University of Washington, Seattle.
- Tutored mechanics labs, waves and optics labs for a year in University of Washington, Seattle.
- Tutored classical mechanics, general physics and electronics labs in Indian Institute of Technology Madras, India for three years.