

Amitkumar Patel



Contact Information	Personal Details
Government Science College, Sector-15 Gandhinagar-382016, INDIA Phone: +91-7043323754 Email: amitphy9898@gmail.com , Amit.Patel02@gujgov.edu.in	Date of Birth: 01 August, 1986 Sex: Male Marital Status: Married Nationality: Indian Language: English (Business proficiency) Gujarati, Hindi

Career Objective:

I am looking forward for a better opportunity to enhance my research career, especially in experimental plasma science and technology and related fields that is interesting and have challenges.

Research Interests:

Plasma sources and their application, Plasma Diagnostics, Plasma waves and instability, Plasma Spectroscopy, Microwave plasma sources etc.

Present and Past Position:

- Assistant Professor
January, 2023 - Present
Government Science College, Gandhinagar, Gujarat, India.
- Post-doctoral fellow
August, 2022- January, 2022
Institute of Plasma Physics and Micro fusion, Warsaw, Poland.
- Post-doctoral fellow
February, 2019-August, 2022
Institute for Plasma Research, Gujarat, India.

- Laboratory Assistant
March, 2012-August-2012
Indian Institute of Technology, Gandhinagar, Palaj, Gandhinagar - 382055, Gujarat
- Assistant Professor
June, 2011-January, 2012
**Shree Satsangi Sanketdham “Ram Ashram” Group of Institutions, Gujarat
Technology University, Vadasma, Mehsana, Gujarat, India.**
- Project fellow
August, 2010-July, 2011
Department of Physics, Sardar Patel University, Anand, Gujarat, India.

Education:

• Ph.D.

2012-2019

Thesis Title: **Study of plasma in a versatile multi-pole line Cusp Magnetic field.**

Thesis Advisor: Dr. N. Ramasubramanian

Institute for Plasma Research, Gandhinagar, India

• M. Phil. in Condensed Matter Physics (2009-2010)

Dissertation Title: **“Study of certain thermodynamic properties of ZrC and TiC using an empirical iterative approach”**

Department of Physic, Sardar Patel University, Gujarat, India

• M.Sc. in Solid State Physics (2007-2009)

Department of Physic, Sardar Patel University, Gujarat, India

• B.Sc. [Subject: Physics (Hons.), Mathematics, Chemistry, Biology, (2004-2007)]

Municipal Arts and Urban bank science college, Mehsana

Hemchandracharya North Gujarat University, Gujarat, India.

Experimental Skills:

- I have involved in design, developed, fabrication and integration of the multi-pole line cusp magnetic field plasma device from scratch through which the following skills have been achieved.
 - Operating and joining of ultra-high vacuum chamber system with Turbo molecular pump backed up by Rotary pump, gate valves, pressure transducers, all metallic leak valves, etc.

- Involved in design Magnet system consisting of Vacoflux-50 core material based electromagnet with pan-cake winding and validate multi-dipole cusp configuration by performing simulation in FEMM and COMSOL software.
 - Design, developing and application of electric and magnetic probe i.e. Langmuir probe, emissive probe, Langmuir probe array, Mach probe, B-dot probe.
- Involved in design the complete set up for exciting and detecting ion acoustic wave and soliton in quiescent Argon plasma.
 - Involved in the design and testing in the hot tungsten plate based contact ionization plasma source as well as cesium oven.
 - Involved in design, fabrication and simulation of multi-pole cusp magnetic field configuration as well design and application of plasma diagnostics for washer gun plasma based SYMPLE device.
 - Involved in design, fabrication and simulation of spiral antenna based RF plasma confined in MPD well design and application of plasma diagnostics for characterize RF plasma.
 - I have hands on experience to design, fabrication and application of fast sweep Langmuir probe, B-dot probe, and Langmuir probe array for LVPD device.

Computational Skills:

MATLAB, Origin, FEMM, COMSOL, FORTRAN, CST simulation for microwave plasma based diamond reactor

Work reports and Dissertations:

- **2012-2019 (Ph.D.)**

Thesis Title: **Study of plasma in a versatile multi-pole line Cusp Magnetic field.**

Advisor: Dr. N. Ramasubramanian

Institute for Plasma Research, Gandhinagar, India.

- **May 2013 - September 2013:**

Pre-Doctoral Course Research Project, Institute for Plasma research,

Gandhinagar, Advisor: Dr L. M. Awasthi

Project Title: **Study of Electron Temperature gradient driven Transport in Finite Beta Plasma of LVPD.**

- **M.Phil.** in Condensed Matter Physics (2009-2010)

Dissertation Title: **Study of certain thermodynamic properties of ZrC and TiC using an empirical iterative approach**

Department of Physic, Sardar Patel University, Gujarat, India

List of Publications

1. M. A. Ansari, **Amit D. Patel**, A. Das Ali, Prabal K. Chattopadhyay, N. Ramasubramanian, Daniel Raju, and Raj Singh “*Characterization of Plasma Discharge in a Multi Dipole Line Cusp Magnetic field created by an RF Source Coupled by a Spiral Antenna*” *IEEE Transactions on Plasma Sci.*, **51**, 625 (2023).
2. **A. D. Patel**, A. Amardas¹, N. Ramasubramanian, “*Finite element simulation for validation of multi-dipole line cusp magnetic field configuration for MPD*” *IPR/Lib./T.R.* 679 (2022).
3. **A. D. Patel**, Zubin Shaikh, M. Sharma, Santosh P. Pandya, and N. Ramasubramanian, “*Coaxial tungsten hot plate based cathode source for cesium plasma production confined in MPD device*” *IPR/Lib./T.R.* 676 (2022).
4. Suresh Basnet, **Amit Patel**, Raju Khanal “*Electronegative magnetized plasma sheath properties in the presence of non-Maxwellian electrons with a homogeneous ion source*” *Plasma Phys. Control. Fusion* 62 115011 (2020).
5. **A. D. Patel**, M. Sharma, N. Ramasubramanian, J. Ghosh, P. K. Chattopadhyay, “*Characterization of Argon Plasma in a variable Multi - pole line Cusp Magnetic Field (VMM F) Configuration*” *Phys. Scr.* **95**, 035602 (2020).
6. M. Sharma, **A. D. Patel**, N. Ramasubramanian, R. Ganesh, P. K. Chattopadhyay, and Y. C. Saxena, “*Evidence for neutrals carrying ion-acoustic wave momentum in a partially ionized plasma*” *Phys. Plasmas* **27**, 022120 (2020).
7. M. Sharma, **A. D. Patel**, N. Ramasubramanian, R. Ganesh, P. K. Chattopadhyay, and Y. C. Saxena, “*Role of multi-cusp magnetic field on plasma containment*” *Plasma Res. Express* **2**, 045001 (2020).
8. **A. D. Patel**, M. Sharma, N. Ramasubramanian, R. Ganesh, and P. K. Chattopadhyay, “*A new multi-line cusp magnetic field plasma device (MPD) with variable magnetic field*”

Rev. Sci. Instrum., **44**, 726 (2018).

9. **A. D. Patel**, S. G. Khambholja, N. K. Bhatt, B. Y. Thakore, and A. R. Jani, “*Thermodynamic Properties of ZnO with in Mie– Grüneisen Hypothesis*”, *J. Nan-Electron Phys* **3**, 885-888(2011).
10. **A. D. Patel**, S. G. Khambholja, N. K. Bhatt, B. Y. Thakore, and A. R. Jani, “*Thermal Properties of TaC with in Mie– Grüneisen Hypothesis*”, *J. Sci. Tec. (National Journal)*, ISSN: 0974-9780 **2(1)** (2011) 48.

Publications in Conference Proceedings:

1. **A. D. Patel**, S. G. Khambholja, N. K. Bhatt, B. Y. Thakore, and A. R. Jani, “*Thermal Properties of CdO with in Mie–Grüneisen Hypothesis*” AIP Conference Proceedings **1393**, 83 (2011); doi: <http://dx.doi.org/10.1063/1.3653620>
2. **A. D. Patel**, S. G. Khambholja, N. K. Bhatt, B. Y. Thakore, P. R. Vyas, and A. R. Jani, “*Thermal EOS of PtC with in Mie–Grüneisen Hypothesis*” AIP Conference Proceedings **1349**, 85 (2011); doi: <http://dx.doi.org/10.1063/1.3605749>

Selected list of Poster Presented at International Conferences:

1. V. P. Anitha, P.J. Rathod, **A.D. Patel**, U.K. Goswami, “**Confinement of washer-gun plasma and tailoring of location and scale length of electron density gradient to meet the requisites of microwave plasma interaction**”, *49TH IEEE INTERNATIONAL CONFERENCE ON PLASMA SCIENCE (ICOPS)*, Sheraton Grand Seattle, Washington USA, May 22-26, 2022 .
2. **A. D. Patel**, M. Sharma, Z. Shaikh, and N. Ramasubramanian “**Co-axial Tungsten Hot Plate Ionizer for Multi-Cusp Plasma Device: Improved Design**”, *1st International conference on Advances in Plasma Science and Technology (ICAPST)*, Sri Shakthi Institute of Engineering and Technology, Coimbatore ,12-14 February, 2020.
3. **A. D. Patel**, M. Sharma, N. Ramasubramanian, and P. K. Chattopadhyay “**Study of plasma state in a multi-pole line cusp variable magnetic field**”, *9th East Asia School and workshop on Laboratory, space and Astrophysical plasma (EASW-9)*, Nagoya University Japan , 29-July to 2 August 2019.

4. **A. D. Patel**, M. Sharma, N. Ramasubramanian, and P. K. Chattopadhyay “**On the characteristic of argon plasma in a multi-pole line cusp variable magnetic field**”, *9th International conference on the Frontier of Plasma Physics and Technology (FPPT-9), Negombo, Srilanka, 8-12 April 2019.*
5. **A. D. Patel**, M. Sharma, N. Ramasubramanian, and P. K. Chattopadhyay “**Electro- Magnet for Cesium Plasma Confined in a Multi-Line Cusp Magnetic Field**”, *44th European Physical Society Conference on Plasma Physics, Queen's University, Belfast, Northern Ireland, 26-30, May 2017.*
6. **A. D. Patel**, M. Sharma, N. Ramasubramanian, and P. K. Chattopadhyay “**Characterization of Argon Plasma in a Multi-pole line Cusp Magnetic Field: Towards a Favourable Source for NBI System**”, *27th IAEA Fusion Energy Conference, Institute for Plasma Research, Gandhinagar, India, October 22-27, 2018.*
7. **A. D. Patel**, Meenakshee Sharma, N. Ramasubramanian, and P. K. Chattopadhyay, “**Study of fluctuation in Argon Plasma in Multi-Cusp Magnetic field Plasma Device**” *International conference on Frontier of physics and plasma physics held at Ujjain Engineering College, India, November 7-8, 2016.*
8. **A. D. Patel**, Meenakshee Sharma, N. Ramasubramanian, and P. K. Chattopadhyay “**Hot Tungsten Plate based ionizer for Cesium Plasma in a Multi-Cusp field Experiment**”, *10th Asia Plasma and Fusion Association Conference (APFA-2015), Institute for Plasma Research, Gandhinagar, India, December 14-18, 2015.*

Subject taught:

Plasma Physics, Fusion Research, Plasma Technology, Classical Mechanics, Electromagnetic Theory, Thermodynamics and Statistical Mechanics. Quantum Mechanics, Nuclear & Particle Physics, and Atomic & Molecular Physics

Professional Memberships:

- Individual member, **European Physical Society (EPS)**, France - 2017 (**Membership # IM-170222**)
- Life member, **Plasma Science Society of India (PSSI)**, Ahmedabad, India since 2013 (**LM - 1086**)

References:

Dr. N. Ramasubramanian (Thesis Supervisor)

Scientist – SG

Institute for Plasma Research

Bhat, Gandhinagar – 382 428

Gujarat, India

Tel: +91-9879301053

E-mail: mani@ipr.res.in

Prof. R. Ganesh (Doctoral Committee member)

Professor

Institute for Plasma Research

Bhat, Gandhinagar – 382 428, Gujarat, India

Mob: +919879173739

E-mail: ganesh@ipr.res.in

Prof. Y. C. Saxena (Doctoral Committee member)

Professor (retired)

Institute for Plasma Research

Bhat, Gandhinagar – 382 428, Gujarat, India

E-mail: yogesh.saxena@gmail.com