



JYOTSHANA V. PRAJAPAT

PROFESSOR

HEAD, DEPT. OF MATHEMATICS (2015-2018)

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RESEARCH INTERESTS

- Partial Differential Equations
- Differential Geometry
- Geometric Analysis

AMS Subj. Class.: 35J60, 58J70, 35H20

EDUCATION

- **PhD (1997)** University of Bombay
- **MPhil (1992)** University of Bombay
- **M.Phil and PhD Advisor:**
Professor S. Kumaresan
- **MSc. Mathematics (April, 1990)**
with 96.5 % University of Bombay

WORK EXPERIENCE

- **June 2013 - Present:** Professor
Department of Mathematics, University of Mumbai
- **July 2008 - May 2013:** Associate Professor
The Petroleum Institute, Abu Dhabi, UAE
- **July 2006 - July 2008:** Visiting Scientist
Tata Institute of Fundamental Research, Mumbai
- **May 2005 - May 2006:** Assistant Professor
IITB
- **August 2004 - May 2005:** Visiting Assistant Professor
University of Alabama at Birmingham, USA
- **May 1999 - Nov 2004:** Assistant Professor
Indian Statistical Institute, Bangalore
- **Feb 1999 - May 1999:** Fellow (D)
TIFR Center, Bangalore
- **Feb 1996 - Feb 1999:** Visiting fellow
Tata Institute of Fundamental Research, Mumbai

SCHOLARSHIPS & GRANTS

- **Senior Research Associate**, ICTP (2018-2023)
- **GIAN Program** (Oct 23-27, 2017)
- **Distinguished evaluator for the Excellence Initiative** promoted by the Government of Spain (2015 & 2018)
- **International Mathematical Union grant** for ICM 2002 at Beijing and ICM 2006 at Madrid.
- **Indo-French grant** to visit Ceremade, Universite' Paris IX Dauphine (Oct 30 - Dec 12, 2000)
- **Junior Visiting Professor** at Dipartimento di Matematica, La Sapienza, University of Rome I (Sept 6 - Dec 6, 1998)
- **CNRS Post-doctoral scholarship** at Laboratoire d'Analyse Numerique,
University of Paris VI (Oct 13, 1997 - Jan 13, 1998)
- **NBHM Scholarship** for PhD
- **UGC Scholarship** for MSc

INTERDISCIPLINARY COLLABORATIONS

- Al Mazrooei, A.A., Prajapat, J. V., Vega, S., Preliminary experiments to evaluate the Gassmann equation in carbonate rocks: calcite and dolomite The Leading Edge(2010) v. 29, p. 906-911.
- Professor Sandra Vega of Geoscience Department, The Petroleum Institute on (re)modeling of Gassmann equations compiling frame geometry of rock.
- Prajapat Jyotshana V., Vega Sandra "A model for fluid substitution in Carbonates" (collaboration in Geoscience) submitted for publication.
- Professor Manika Prasad, Colorado School of Mines on a problem related to shell theory. Poster presentation at 2009 AGU Fall Meeting, San Francisco, USA (14 - 18 Dec, 2009)

TRAINING PROGRAMS ATTENDED

- Online Orientation Training Programme for Mentors from Higher Educational Institutions / Universities (UGC), Feb. 1-10, 2021
- EAGE workshop on "Applications and Challenges of Rock Physics for Quantitative Geophysical Interpretation in Dubai", UAE (15 - 18 Jan, 2012)
- EAGE workshop on "EM in hydrocarbon detection" Singapore (11 - 13 April, 2012)

PUBLICATIONS

- Avetik Arkelyan, Shahgholian Henrik, Prajapat Jyotshana V. Two and multiphase quadrature surfaces, to appear in **Communications on Pure and Applied Analysis**, (2017), 16 (6), 2023-2045.
- Lindgren, Erik, Prajapat Jyotshana V. Optimal regularity of a parabolic free boundary problem of two-phase type with coefficients worse than Lipschitz, **Potential Analysis**, 37 (2012), no. 2, 103-123.
- Emamizadeh, Behrouz, Prajapat, Jyotshana V. Minimax rearrangement optimization problems, **Optimization letters**, Vol. 5 (2011) no. 4, pp. 647-664.
- Emamizadeh B., Prajapat Jyotshana V., Shahgholian H, A two phase free boundary problem related to quadrature domains, **Potential Analysis** (2011) 34, 119-138.
- Emamizadeh, Behrouz, Prajapat, Jyotshana V. Symmetry in rearrangement optimization problems", **Electronic Journal of Differential Equations**, Vol. 2009 (2009), No. 149, pp. 1-10.
- Prajapat, Jyotshana V. Taylor series expansion for an analytic hyper- surface in \mathbb{R}^n , **Taiwanese Journal of Mathematics**, 14 (2010), no. 6, 2277-2289.
- Lin, Chang-Shou, Prajapat, Jyotshana V. Vortex condensates for relativistic abelian Chern-Simons model with two Higgs scalar fields and two gauge fields on a torus, **Communications in Mathematical Physics**, Volume 288, Number 1 / (May, 2009)
- Lin, Chang-Shou, Prajapat, Jyotshana V. Asymptotic symmetry of singular solutions of semilinear elliptic equations, **J. Differential Equations** 245 (2008), no. 9, 2534-2550.
- Lin, Chang-Shou, Prajapat, Jyotshana V. Harnack type inequality and apriori estimates for solutions of a class of semilinear elliptic equations, **J. Differential Equations** 244 (2008), no. 3, 649-695.
- J. Giacomoni, J. Prajapat, M. Ramaswamy, Positive solutions for elliptic problems with critical indefinite nonlinearity in bounded domains, Proceedings of the Sixth Mississippi State-UBA Conference on Differential Equations and Computational Simulations, 107-126, Electron. J. Differ. Equ. Conf., 15, Southwest Texas State Univ., San Marcos, TX, 2007.
- R. Magnanini, J.Prajapat, S.Sakaguchi, Stationary isothermic surfaces and uniformly dense domains, **Trans. Amer. Math. Soc.** 358 (2006), no. 11, 4821-4841.
- J. Giacomoni, J. Prajapat, M. Ramaswamy, Positive solution branch for elliptic problems with critical indefinite nonlinearity, **Differential and Integral Equations** 18. (2005), no. 7, 721-764. 35J60
- J. Prajapat, M. Ramaswamy, Apriori estimates for solutions of sub-critical equations on $\mathbb{C}P^1$ sphere, **Advanced Nonlinear Studies**, Vol.3, No.3, 2003.

PREPRINTS

- Sharma Vandana, Prajapat J. V., Global existence of solutions to reaction diffusion systems with mass transport type boundary conditions on an evolving domain - **To appear in Discrete and Continuous Dynamical Systems - Series A**
- Prajapat J. V., "A Calculus proof of the Riesz representation theorem."
- Lucia Marcello, Prajapat J. V., Asymptotic limit of solutions to a Chern-Simons model with two Higgs fields and two gauge fields.
- Prajapat J. V., S. Kumaresan, An integral inequality for compact hypersurfaces in spaces of constant curvature.

EVENTS ORGANIZED

- **UGC-HRDC Refresher course** in Financial Mathematics (under RUSA). (Dec.13-27, 2019)
- **National Mathematics Day**, with NCM and UM-DAE CEBS. (Dec 22, 2018)
- **"International Conference in Mathematics"** celebrating Centenary year of Professor S.S.Shrikhande, the founding Head of University Department of Mathematics. Funding of Rs. 300,000 from NCM, Rs.2,95,000/- from NBHM and Rs. 500,000/- from DST purse (Jan 22 - 25, 2018)
- **GIAN course** by Prof. Henrik Shahgholian, KTH Sweden (Oct 23 - 27, 2017)
- **NBHM sponsored** workshop on Basic Complex Analysis with funding of Rs. 95000/- (Feb 1 - 6, 2016)
- Basic course in Algebra and Analysis workshop (Dec 14 - 19, 2015)
- **Orientation program for MSc students:** (i) Prof. S. Kumaresan (Jan.7-8, 2015, Oct. 3-4, 2017) (ii) Prof. Uttara Sahasrabuddhe (Mar.30,2017)
- **MAPLE FDP** for University (Sep.13, 2017)
- International Symposium on Partial Differential Equations, College of Arts & Science, The Petroleum Institute (March 22 - 23, 2010)
- Special session on PDE at the "The First International Conference on Mathematics and Statistics, AUS-ICMS'10"

PUBLICATIONS CONTD.

- J. Prajapat, G. Tarantello, On a class of Elliptic problems in R^n : Symmetry and Uniqueness Results, University of Rome, Tor Vergata Preprint, **Proc. Royal Soc. Edinburgh**, Vol.131, Part 4(2001), 967-985.
- I. Birindelli, J. Prajapat, One dimensional symmetry in the Heisenberg group, **Ann. Scuola Norm. Sup. Pisa Cl. Sci.(4)**, Vol.XXX(2001), 269-284.
- I. Birindelli, J. Prajapat, Monotonicity and symmetry results for degenerate elliptic equations on nilpotent Lie groups, University of Rome, La Sapienza preprint, **Pacific Jr. of Math.**, Vol.204, No.1, (2002), 1-18.
- F. Brock, J. Prajapat, Some new symmetry results for elliptic problems on sphere and in Euclidean space, **Rendiconti del Circolo Matematica di Palermo(2)**, Vol.49, No.3, 2000.
- I. Birindelli, J. Prajapat, Nonlinear Liouville theorems in the Heisenberg group, via the moving planes methods, **Comm. In PDE.**, Vol. 24, No. 9 and 10, 1999.
- J. Prajapat, Serrin's result for domains with a Corner or Cusp, **Duke Mathematical Jr.**, Vol. 91, No. 1, 1998.
- S. Kumaresan, J. Prajapat, Analogue of Gidas-Nirenberg result for Domains in Hyperbolic Space and Sphere, **Rendiconti Dell'Istituto Di Matematica, Dell'Universita Di Trieste**, Nuova Serie, 30, No. 1-2, 1999.
- S. Kumaresan, J. Prajapat, Serrin's Result for Hyperbolic Space and Sphere, **Duke Mathematical Jr.**, Vol. 91, No. 1, (1998)
- A Construction of Lebesgue Integral on R^∞

SEMINARS / CONFERENCE PARTICIPATION

- Invited participant at Workshop in Geometric Measure Theory, Hausdorff Institute for Mathematics, Bonn (Feb 11 - 16, 2019)
- Session chair in "Recent Developments in "Nonlinear Partial Differential Equations and Applications" (Nov 1 - 4, 2017) (<https://www.math.tifrbng.res.in/npde2017>)
- Scientific committee member in National conference on Differential Equations and Applications, UDM (Feb 14 - 15, 2014)
- Educational Interfaces Between Mathematics and Industry, ICT Mumbai (Jan 23 - 24, 2014)
- Seminar at PE Dept., Colorado School of Mines, USA. titled "Application of shell Theory to Carbonate compaction".
- Rutgers University, (March, 2006)
- Courant Institute, NYU, (Sept 13, 2006)
- ICM 2006, Madrid.
- Indo-UK Study Group Meeting on Industrial Problems, M.S. University Baroda, (March 20-24, 2006)
- Colloquium at ISI Bangalore, (Dec, 2005)
- Rutgers University, (March, 2005)
- Courant Institute, NYU (March, 2005)
- University of Alabama at Birmingham, USA (March 4, 2005)
- National Chung Cheng University, Taiwan (2004)
- Workshop and Conference on Recent Trends in Nonlinear Variational Problems, ICTP, Trieste, Italy (April 22 - May 9, 2003)
- ICM 2002 at Beijing, China (Aug 20 - 28, 2002)
- University of Cergy, Pontoise (Dec 6, 2000)
- University of Paris 6, (Nov 22, 2000)
- University of Paris 9, Ceremade (Nov 7, 2000)
- Courant Institute of Math. Studies, NYU (Dec. 9, 1999)
- Rutgers University (Nov 2, 1999)

INVITED TALKS

- Seminar at ICTP, 14 November 2019 and online on 12 Nov. 2020.
- Invited speaker at "Indian Women and Mathematics" conference, SNU University Noida (May 21 - 23, 2018)
- Paper presentation in Theoretical and Computational Partial Differential Equations organized at Panjab University (Nov, 2016)
- Invited speaker in the Refresher course on "Computational methods in Basic Sciences organized by Academic staff college (Dec 1, 2015 & Dec 4, 2015)
- Speaker in special session at the Indian Congress for Mathematician, University of Mumbai (Jan, 2015)
- Invited speaker in "Recent Advances in Differential Equations held at TIFR-CAM, Bangalore (Dec 17 - 18, 2014)
- Invited speaker in Workshop at Jaihind College (Nov 28, 2014)
- Invited speaker in 29th Annual Conference of the Ramanujan Mathematical Society at IISER Pune (June 23 - 27, 2014)
- The conference "Indian Women and Mathematics 2013", Department of Mathematics, University of Mumbai (Dec 23 - 28, 2013)
- Refresher course at ICT titled Role of Mathematics and statistics in technological development (Nov, 2013)
- Pi-Day with Chern-Simons Theory at the Graduate centre, CUNY, NY, USA (March 14, 2013)
- Presentation in "The 1st ADNOC R and D Annual Conference", Abu Dhabi, U.A.E. (May 16 - 17, 2012)
- Participation in "Mathematics Education-trends and challenges", Central University of Hyderabad, India (Conference in honour of my Advisor Prof. S. Kumaresan's 60th birthday). (Aug 19 - 21, 2011)
- "Geometric properties of solutions of nonlinear PDEs and their applications", Banff, Canada. (July 17 - 22, 2011)
- Conference in honour of Prof. P.N.Srikanth, "Recent trends in nonlinear elliptic partial differential equations", (Jan 6 - 8, 2011)
- The ICM Satellite Conference on PDE and related topics, TIFR-CAM Bangalore, India. (Aug 13 - 17, 2010)
- International Symposium on Partial Differential Equations, College of Arts & Science, The Petroleum Institute titled "Two Phase Free Boundary Problems" (March 22 - 23, 2010)
- Special session on PDE at the "The First International Conference on Mathematics and Statistics, AUS-ICMS'10 titled "Existence of solutions for relativistic Abelian Chern-Simons model with two Higgs scalar fields and two gauge fields on a Torus"
- Workshop on the occasion of the visit of Prof. John B. Conway, Abu Dhabi campus of Zayed University, presentation titled "Partial Differential Equations related to the Chern-Simons theories" (Feb 11, 2009)

SEMINARS / CONFERENCE PARTICIPATION

- University of L'Aquila
- University of Rome 1, La Sapienza; University of Florence
- Mathematics Research Centre, University of Warwick, UK.
- University of Basel, Switzerland.
- University of Rennes 1, IRMAR France.
- Ecole Normale Supérieure, Paris.
- Rutgers University, New Brunswick.
- Indian Statistical Institute, Bangalore.
- Tata Institute of Fundamental Research, Bangalore
- Tata Institute of Fundamental Research, Mumbai.
- Conference on Geometric problems in PDE at Oberwolfach, Germany (24 - 30 Jan, 1998)
- Conference on Partial Differential Equations and Application to Geometry, ICTP Italy (1995)
- Indo-French Conference on Elliptic Partial Differential Equations, TIFR Bangalore (1994)
- Summer School on Geometric Measure Theory and Second Order Partial Differential Equations, TIFR-IISC Bangalore (1992)
- Instructional Conference on Elliptic Curves, TIFR Bombay (1991)
- Instructional Conference on Riemannian Geometry, TIFR Bombay (1990)

INVITED TALKS CONTD.

- Sesqui-centennial celebration of University of Mumbai, (Jan, 2007)
- International Conference in Nonlinear Analysis NCTS, Hsinchu (Nov, 2006)
- National Seminar on Recent Advances in Mathematical Analysis and Applications (Oct 6 - 7, 2005)
- The 2005 UAB International Conference on Differential Equations and Mathematical Physics, Birmingham, Alabama (March 29 - April 2, 2005)
- VI Southeast Geometry Seminar at University of Alabama at Birmingham, USA (Dec 8, 2004)
- Conference on Elliptic and Parabolic Problems: Recent Advances; in National Tsing Hua University, Taiwan (Feb 16 - 20, 2004)
- Conference in Department of Mathematics Ehime University, Matsuyama, Japan (Feb, 2003)
- Ehime University, Matsuyama, Japan (Jan - Feb, 2003)
- International Conference on Nonlinear PDE and Applications, TIFR Bangalore (1996)