

**Dr. ANJU SAINI**

Postdoctoral Fellow

Centre of Excellence in Transportation Systems

IIT Roorkee

Tel: +91-9756955890

Email: [anju.iitr@gmail.com](mailto:anju.iitr@gmail.com)**EDUCATIONAL QUALIFICATION:**

- Currently a Postdoctoral Fellow from 10 February 2014. Indian Institute of Technology Roorkee, India
- Worked as Abel Visiting Postdoctoral Fellow at Mathematical Modelling Lab Department of Maths and Information Sciences, Faculty of Engineering and Environment, Northumbria University. Newcastle upon Tyne, NE2 1XE, UK from 25 September, 2015 to 30 October, 2015.
- Ph.D., Applied Mathematics - 2008-2013.  
Title of Thesis: Mathematical Modeling of Lung Mechanics  
Indian Institute of Technology Roorkee  
  
GATE (Graduate Aptitude Test in Engineering) -2005 & 2007.  
Junior Research Fellow (MHRD Fellowship) 2008-10, IIT Roorkee.  
Senior Research Fellow (MHRD Fellowship) 2010-13, IIT Roorkee.
- M.Sc., Applied Mathematics - 2002-2004  
Indian Institute of Technology Roorkee
- B.Sc - 1999-2002  
Subjects : Mathematics, Physics and Chemistry  
K.L.D.A.V. Degree College Roorkee, C.C.S university Meerut, India

**Research Interests:** - Mathematical Modeling, Biomechanics (Respiratory mechanics), C.F.D., Numerical Analysis, Partial Differential Equations.

**PROJECTS:**

1. One Project report on “State Variable Analysis and Design” in M.Sc. III semester.
2. One Dissertation on “Optimal Control Systems” in M.Sc. IV semester.

**TEACHING EXPERIENCE:**

Taken Tutorial classes of UG and PG students at IIT Roorkee from January 2009 to December 2012.

**PUBLICATIONS:**

1. **Anju Saini**, V.K.Katiyar, Pratibha, “Mathematical Modeling of Lung Mechanics-A review”, Indian Journal of Biomechanics, special issue, 13-16, 2009.
2. **Anju Saini**, V.K.Katiyar, Pratibha, and Devdatta, “Numerical Simulation of the Transport of Inert gases in Lung Tissue”, Int. J. of Appl. Math and Mech. **6** (15): 46-57, 2010.

3. Devdatta, V.K.Katiyar, Pratibha, **Anju Saini** “Mathematical study of blood partial pressure of human respiratory system” International Transactions in Mathematical Sciences and computers, Vol. 4, No. 2, pp. 343-346, 2011.
4. **Anju Saini**, V.K.Katiyar and Pratibha (2012), “Modelling of inert gas transport to tissue and blood return to the lungs” Indian Journal of Biomechanics (ISSN: 0974-0783) Vol. 3, Issue 1-2, pp.6-12.
5. Devdatta, V.K.Katiyar, Pratibha, **Anju Saini** (2012), “Modelling of Blood Partial Pressure of Human Respiratory System” Indian Journal of Biomechanics (ISSN: 0974-0783) Vol. 3, Issue 1-2, pp. 47-49.
6. **Anju Saini**, V.K.Katiyar and Pratibha (2014), “Effects of First Order Chemical Reactions on the Dispersion Coefficient Associated With Laminar Flow through the Lungs”, International Journal of Biomathematics, World Scientific (ISSN: 1793-7159). Vol. 7, No. 2, 1450021 (12 pages) (**Impact Factor 0.633**). (SCI)
7. **Anju Saini**, V.K.Katiyar and Pratibha (2015), “Numerical simulation of gas flow through a biofilter in lung tissues”, World Journal of Modeling and Simulation, An International Journal, Vol. 11, No. 1, pp. 33-42.
8. **Anju Saini**, V.K.Katiyar and M. Parida (2016), “Two Dimensional Model of Pulsatile Flow of a Dusty Fluid through a Tube with Axisymmetric Constriction”, World Journal of Modeling and Simulation, An International Journal, Vol. 12, No. 1, pp. 70-78.

#### CONFERENCES PROCEEDINGS:

1. **Anju Saini**, V.K.Katiyar, Pratibha and Devdatta, 2010. Numerical Study of One-dimensional Model of Blast Wave Propagation through Lungs, WCB 2010, IFMBE Proceedings 31, pp. 725–728, Springer.
2. Devdatta, V.K. Katiyar, Pratibha, and **Anju Saini**, 2010. Numerical Study of Blood Partial Pressure of the Human Respiratory System, WCB 2010, IFMBE Proceedings 31, pp. 722–724, Springer.
3. **Anju Saini**, V.K.Katiyar, Pratibha and Devdatta, 2010. Numerical Study of Breathing as Low Frequency Wave Propagation Through Lungs, FMFP-2010 (Fluid Mechanics & Fluid Power) Proceeding FMFP10 - BN – 02.
4. **Anju Saini**, V.K.Katiyar, and Pratibha, 2011. Numerical study of the dispersion in flow through the lungs with a retentive and absorptive wall, AMOC-2011, pp. 1422-1426.

#### CONFERENCES IN ABROAD:

1. **Anju Saini**, V.K.Katiyar, Pratibha and Devdatta, 2010. Numerical Study of One-dimensional Model of Blast Wave Propagation through Lungs, 6th World Congress on Bio Mechanics, August 1 – 6, Singapore, IFMBE Proceedings 31, pp. 725–728.
2. **Anju Saini**, V.K.Katiyar, Pratibha and Devdatta, 2012. Nanoparticle Deposition in Realistic Human Lung Airway Models with Different Inlet Conditions, 6<sup>th</sup> European Congress of Mathematics (6 ECM), July 2-7, Jagiellonian University, Krakow Poland.
3. **Anju Saini**, M. Parida and V.K.Katiyar, 2014. Mathematical modeling of biofilter used for air flow through lung tissues, Caucasian Mathematics Conference (CMC I), Ivane Javakhishvili Tbilisi State University, September 5-6, Tbilisi, Georgia.

4. **Anju Saini**, V.K. Katiyar and M. Paria, 2015. Multiscale modelling of continuum mechanics of lungs, International Congress of Industrial and Applied Mathematics (ICIAM-2015), August 10-14, Beijing, China.

#### **SUMMER SCHOOL IN ABROAD:**

1. Attended “5th Women in Mathematics Summer School on Mathematical Theories towards Environmental Models”, The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, May 27<sup>th</sup>- June 1<sup>st</sup>, 2013.
2. Participated and presented a contributed talk on Mathematics in “16<sup>th</sup> General Meeting of European Women in Mathematics” on 2-6 September 2013 Hausdorff Center for Mathematics (HIM), University of Bonn, Germany.
3. Attended European Women in Mathematics Joint EMS/EWM Survey Lectures July 1 2012 in Krakow, Poland, A satellite conference to the 6ECM.
4. Presented a paper entitled “Mathematical Model of Pulsatile Flow of a dusty fluid through a symmetrical constricted tube” at the workshop “Women in Applied Maths and Soft Matter Physics” 26-28 October, 2015 in Mainz, Germany.

#### **CONFERENCES PRESENTATIONS:**

1. **Anju Saini**, Devdatta, V.K.Katiyar, and Pratibha, 2010. Numerical Study of Inert Gas Transport to Tissue, 11th International Conference of the International Academy of Physical Sciences, February 20 – 22, Allahabad.
2. Attended “INTERNATIONAL CONGRESS OF MATHEMATICIANS 2010” held at Hyderabad, India from 19 – 27 August 2010.
3. **Anju Saini**, Devdatta, V.K.Katiyar, and Pratibha, 2010. Numerical Simulation of Transmural Transport of Oxygen to the Retina, ICWM International Conference of Women Mathematicians, Aug 17-18, University of Hyderabad, India.
4. **Anju Saini**, V.K.Katiyar, Pratibha and Devdatta, 2010. Numerical Study of Breathing as Low Frequency Wave Propagation Through Lungs, FMFP-2010 (Fluid Mechanics & Fluid Power) International Conference, Dec 16-18, IIT Madras, Chennai, India. FMFP10 - BN – 02.
5. **Anju Saini**, V.K.Katiyar, Pratibha and Devdatta, 2011. Numerical Simulation of Airflow in the Human Lungs, National Conference on “Role of Mathematical and Physical Sciences in Engineering and Technology”, Oct 21-22, Government Degree College Karanprayag (Chamoli) Uttarakhand, India.
6. Participated in International Conference on Soft Computing for Problem Solving held at The Institution of Engineers, IIT Campus Roorkee during December 20-22,2011.
7. **Anju Saini**, V.K.Katiyar, and Pratibha, 2011. Numerical study of the dispersion in flow through the lungs with a retentive and absorptive wall, International Conference on Advances in Mathematics, Optimization and Computing (AMOC-2011), Dec. 5 – 7, IIT Roorkee, pp. 1422-1426.
8. Attended Young Research Conclave-2012 in IIT Gandhi Nagar during 27-29 Dec. 2012.
9. **Anju Saini**, V.K. Katiyar and M. Parida, 2015. Numerical Modeling of Drug Release into Artery Wall from Stent, Young Scientists’ Conference as part of India International Science Festival (IISF), 4-8 December 2015, IIT Delhi, India.

10. **Anju Saini**, V.K. Katiyar and M. Parida, 2016. Analysis of Nanoparticle Transport and Deposition in the Human Lung Airways, International Conference on Special Functions & Applications, and Symposium on Applications of Mathematical Science in Engineering Problems (ICSFA-2016), 9-11 September 2016, Jamia Millia Islamia, New Delhi, India.
11. **Anju Saini**, V.K. Katiyar and Maia Angelova, 2016. Multiscale modeling of lung parenchyma, India International Science Festival (IISF) - Young Scientists' Conclave (YSC), Dec 8-11, 2016, NPL, New Delhi.

#### **WORKSHOPS:**

1. Workshop on Study Group Meeting on Industrial Problems held at Department of Mathematics, IIT Roorkee in collaboration with IMG, IIT Bombay and OCCAM, U.K. during March 16-21, 2009.
2. National Research Scholar Meet in Mathematical Science which was held at Department of Mathematics, IIT Roorkee during Dec. 19-23, 2009, attended.
3. Attended one day workshop "Library Orientation Program and Workshop on Scopus and ScienceDirect" on 27 Feb, 2012 organized by the Mahatma Gandhi Central Library, IIT Roorkee.
4. Attended one day workshop "NI LabVIEW-Basic Workshop" on 25 March 2012 organized by National Instruments India.
5. Attended one day QIP Workshop on "Interaction of Academia-Industry on Mathematical Modeling" organized by Department of Mathematics IIT Roorkee on 31 March 2012.
6. Attended an online workshop "webcast on charting a course for a successful research career" on 11th July, 2012 organized by the Trinity College Dublin.
7. Attended an online workshop "webcast on Ethics in scientific article submission and publishing" on 11th July, 2012 organized by the Trinity College Dublin.
8. Attended one day QIP Workshop on "Breathing Mechanics" organized by Department of Mathematics IIT Roorkee on 31 March 2013.
9. Participated in the short course "Nanotechnology Journey from Quantum Physics to Nanoengineering" by Prof. Vijay K. Arora, IEEE-EDS Distinguished Lecturer, Wilkes University, USA on April 2, 2014 organized by Department of Electronics and Communication Engineering, IIT Roorkee.
10. Attended in a national workshop on "Research Methodologies for Sustainable Built Environment" sponsored by Ministry of New and Renewable Energy and organized by the Department of Architecture and Planning, IIT Roorkee, Roorkee during October 16-18, 2014.
11. Attended one day Workshop on "Using Web of Science for Research" organized by Central Library, IIT Roorkee, India on February 27, 2015.
12. Attended one day QIP Workshop on "Transportation Safety" organized by Department of Mathematics IIT Roorkee on February 20, 2016.

#### **ACADEMIC ACHIEVEMENTS:**

1. Received a merit-cum-scholarship in M.Sc.
2. Qualified Graduate Aptitude Test in Engineering (GATE) in the year 2005 and 2007.

3. Received a Travel Award Singapore \$850 at 6<sup>th</sup> World Congress of Biomechanics-2010 for presenting a paper.
4. Received DST Funding to go to Singapore for presenting a paper in 2010.
5. Received CSIR Foreign Travel Grant to go to Krakow, Poland for presenting a paper.
6. Awarded the Support Grant covers registration fees, Accommodation and per diem from European Women in Mathematics in 6<sup>th</sup> European Congress of Mathematics 2012.
7. Awarded Travel Grant to attend Young Research Conclave 2012 (YRC2012) in IIT Gandhi Nagar.
8. Awarded Full Funding with Travel Grant by International Centre for Theoretical Physics (ICTP), Trieste, Italy, 2013.
9. Awarded Full Funding with Travel Grant by European Women in Mathematics (EWM) for participating in “16<sup>th</sup> General Meeting of European Women in Mathematics” on 2-6 September 2013 Hausdorff Center for Mathematics, University of Bonn, Germany.
10. Awarded Post Doctoral Fellowship From National Board for Higher Mathematics (NBHM) on November 8, 2013.
11. Received DST Funding to go to Tbilisi, Georgia to contribute a talk in 2014.
12. Received NBHM, Govt. of India Financial Support for presenting a paper in International conference ICIAM-2015, Beijing, China.
13. Awarded Abel Visiting Scholar Program Grant in 2015 supported by Niels Henrik Abel Board and IMU-CDC.
14. Awarded Full funding by Johannes Gutenberg University Mainz for participating in a workshop “Women in Applied Maths and Soft Matter Physics” in Mainz, Germany.
15. Awarded Full funding for Oral Presentation in India International Science Festival by Ministry of Science and Technology, Government of India.

#### **MEMBERSHIPS:**

1. Life Member of Indian Society of Biomechanics (ISB).
2. Life Member of National Society of Fluid Mechanics and Fluid Power (India).
3. Life Member of The Trinity Mathematical Society, Cambridge University, United Kingdom.
4. Member of American Mathematical Society (AMS).
5. Member of European Mathematical Society (EMS).
6. Member of European Women in Mathematics (EWM).
7. Life Member of Organization for Women in Science for the Developing World (OWSD) ICTP Trieste, Italy.
8. Life Member of Fractional Analysis and Applications Group, Egypt.
9. Life Member Lepage Research Institute (LRI), University of Presov, Slovakia.

#### **COMPUTER AWARENESS:**

Programming Languages: C, C++.

Software Packages: MS Word, PowerPoint and Excel, Matlab, Origin.

**REFERENCES:**

<p><b>Dr. V.K.Katiyar</b> (Ph.D and PDF Supervisor) Professor &amp; Head Department of Mathematics, Indian Institute of Technology Roorkee, Roorkee-India- 247667 Email: <a href="mailto:vktmafma20@gmail.com">vktmafma20@gmail.com</a></p>	<p><b>Dr. M. Parida</b> (PDF Mentor) Professor &amp; Dean SRIC Department of Civil Engineering, Indian Institute of Technology Roorkee, Roorkee-India- 247667 Email: <a href="mailto:mparida@gmail.com">mparida@gmail.com</a></p>
<p><b>Dr. Maia Angelova</b> (Visiting Fellow Mentor) Professor of Mathematical Physics Department of Mathematics and Information Sciences, Faculty of Engineering and Environment, Northumbria University, Newcastle upon Tyne, NE2 1XE, UK Email: <a href="mailto:maia.angelova@northumbria.ac.uk">maia.angelova@northumbria.ac.uk</a></p>	<p><b>Dr. Pratibha</b> (PhD Co-Supervisor) Associate Professor Department of Mathematics, Indian Institute of Technology Roorkee, Roorkee-India- 247667 Email: <a href="mailto:pratibhag@rediffmail.com">pratibhag@rediffmail.com</a></p>