

# Jitender Singh

Assistant Professor

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*"The highest education is that which does not merely give us information but fills our life in harmony with all existence—Rabindranath Tagore"*

## Education

- 2003–2008 **Ph.D. Mathematics**, Panjab University, Chandigarh, INDIA.  
2000–2002 **M.Sc. Mathematics**, Panjab University, Chandigarh, INDIA.  
75%Score  
1997–2000 **B.Sc. Non-Medical**, DAV College Kangra affiliated to HP University, Shimla, INDIA.  
86%Score(**First Position in University**)  
1995–1997 **XII Science**, CBSE, JNV Paprola.  
84%Score  
1995 **Matric**, CBSE, JNV Paprola.  
76%Score

## Ph.D. thesis

Title *The Stability of viscous flow in rotating cylinders with magnetic field*  
Supervisor Renu Bajaj

## Employment detail

- 2009–Present **Assistant Professor**, Guru Nanak Dev University, Amritsar, INDIA.  
2008–2009 **NBHM Post Doctoral Fellow**, Indian Statistical Institute, Kolkata, INDIA.  
2007–2008 **Associate Lecturer**, Jaypee University of Information Technology, Wanknaghat, INDIA.  
2004–2007 **UGC SRF**, Panjab University, Chandigarh, INDIA.  
2003–2004 **UGC JRF**, Panjab University, Chandigarh, INDIA.  
2003 **Lecturer**, DAV College, Kangra (six months), HP, INDIA.

## Broad area(s) of research interest

- Specific areas
- **Number theory:**
    1. Power sums of positive integers and their generalizations
    2. Arithmetic convolutions
  - **General mathematics:** Calculus; Analysis; General topology.
  - **Fluid instabilities:**
    1. Taylor-Couette/Dean problem in ferrofluids
    2. Modulated Rayleigh-Bénard problem
    3. FEM simulation on Rayleigh-Bénard problem
    4. Transient convection

## Publications

### A Number theory

1. J. Singh. Defining sums of products of power sums. *Journal of Integer Sequences*, **19**, 2016, Article 19.1.2.
2. J. Singh. On an arithmetic convolution. *Journal of Integer Sequences*, **17**, 2014, Article 17.6.7.
3. J. Singh. Sums of products involving power sums of  $\varphi(n)$  integers. *Journal of Numbers.*, 1–6, 2014.
4. J. Singh. Defining power sums of  $n$  and  $\varphi(n)$  integers. *International Journal of Number Theory*, **5**:41–53, 2009.

### B General Mathematics

5. J. Singh, and Harpreet K. Grover. Limit and continuity revisited via convergence. 2017 (Unpublished).
6. J. Singh. A Noninductive proof of de Moivre's formula. *American Mathematical Monthly*, (accepted).
7. J. Singh. Another proof of the binomial theorem. *American Mathematical Monthly*, **124**, No.7:658,2017
8. S. S. Singh, and J. Singh. Effect of corrugation on incident qSV-waves in pre-stressed elastic half spaces. *International Journal of Applied Mathematics and Mechanics*, **9**:92–106, 2013.
9. J. Singh. Subgroups of the additive group of real line. *ArXiv Preprint*: <http://arxiv.org/abs/1312.7067>, 1–5, 2013.
10. J. Singh. An application of the Archimedes' hat-box theorem. *American Journal of Applied Mathematics*, **1**:9–10, 2012.

### C Hydrodynamics

11. J. Singh, and R. Bajaj. Stability of temperature modulated convection in a vertical fluid-layer. *Journal of Fluid Mechanics*, (Under review), 2017.
12. P. Kaur, and J. Singh. Heat transfer in thermally modulated two-dimensional Rayleigh Bénard Convection. *International Journal of Thermal Sciences*, **114**:35–43, 2017.
13. P. Kaur, J. Singh, and R. Bajaj. Rayleigh-Bénard convection with two-frequency temperature modulation. *Physical Review E*, **93**:043111, 2016.
14. J. Singh, and R. Bajaj. Dean instability in ferrofluids. *Meccanica*, **51**:835–847, 2016.
15. J. Singh, R. Bajaj, and P. Kaur. Bicritical states in temperature-modulated Rayleigh-Bénard convection. *Physical Review E*, **92**:013005, 2015.
16. J. Singh and S. S. Singh. Instability in temperature modulated rotating Rayleigh-Bénard convection. *Fluid Dynamics Research.*, **46**:015504, 2014.
17. J. Singh. A nonlinear shooting method and its application to nonlinear Rayleigh-Bénard convection. *ISRN Mathematical Physics*, 6502081-9, 2013.
18. J. Singh, E. Hines, and D. Iliescu. Global stability results for temperature modulated convection in ferrofluids. *Applied Mathematics and Computation*, **40**:6204–6211, 2013.
19. J. Singh and R. Bajaj. Convective instability in a ferrofluid layer with temperature modulated rigid boundaries. *Fluid Dynamics Research*, **43**:025502, 2011.
20. J. Singh. Energy relaxation for transient convection in Ferrofluids. *Physical Review E*, **82**:026311, 2010.
21. J. Singh and R. Bajaj. Temperature modulation in Ferrofluid convection. *Physics of Fluids*, **21**:064105, 2009.
22. J. Singh and R. Bajaj. Temperature modulation in Rayleigh-Bénard convection. *The ANZIAM Journal*, **50**:231–245, 2008.
23. J. Singh and R. Bajaj. Parametric modulation of the Taylor-Couette flow in ferrofluids. *Fluid Dynamics Research*, **40**:737–752, 2008.
24. J. Singh and R. Bajaj. Non-axisymmetric modes of Couette-Taylor instability in ferrofluids with radial flow. *Magneto-hydrodynamics*, **42**:57–68, 2006.
25. J. Singh and R. Bajaj. Stability of ferrofluid flow in rotating porous cylinders with radial flow. *Magneto-hydrodynamics*, **42**:46–56, 2006.
26. J. Singh and R. Bajaj. Stability of non-axisymmetric ferrofluid flow in rotating cylinders with magnetic field. *International Journal of Mathematics and Mathematical Sciences*, **23**:3727–3737, 2005.
27. J. Singh and R. Bajaj. Couette flow in ferrofluids with magnetic field. *Journal of Magnetism and Magnetic*

## Other research activities

### Talks & Presentations

1. An invited lecture on *An introduction to Fourier Analysis* at Department of Applied Sciences, Chitkara University, Baddi, Himachal Pradesh, India, on March 24, 2017.
2. 8th International Congress of Industrial and Applied Mathematics (ICIAM2015), held at China National Convention Center, Beijing, China, during August 10-14, 2015. Presented two posters titled *On an arithmetic convolution* and *Bicritical states in temperature modulated Rayleigh-Bénard convection*.
3. An invited lecture on *Calculus* at SD College for Women, Gurdaspur, Punjab, India on March 31, 2015.
4. *ISL-Numerical Analysis* held at Department of Mathematics, Panjab University, Chandigarh, during June 9-28, 2014. Contributed 8 tutorials on MATLAB Programming.
5. Gave 4 lectures on *MATLAB Programming* in Faculty Development Programm held at Rayat Bahara College of Engineering and Technology, Hoshiarpur, during, June 18-24, 2012.
6. *The Legacy of Ramanujan* an international conference held at University of Delhi during December 17-22, 2012. A contributed talk on *Power sums of  $n$  and  $\varphi(n)$  Integers*.
7. International Congress of Mathematicians (ICM 2010) held at HICC Hyderabad during August 19-27, 2010.
8. A talk on *Suspended load on the onset of alternate river bars* at School of Engineering, University of Warwick, United Kingdom on July 07, 2010.
9. Delivered 4 Lectures on MATLAB Programming in a refresher course in Mathematics held at UGC Academic staff college, Guru Nanak Dev University, Amritsar, during December 05-16, 2009.
10. Worked as a Tutor in the Mathematics Training and Talent Search Programme (MTTS-Level O) held at the Department of Mathematics, Panjab University, Chandigarh, during May 27-June 30, 2007.
11. International Congress of Industrial and Applied Mathematics (ICIAM 2007), held in Zürich, Switzerland, during July 16-20, 2007, Presented a Poster.

### Professional Training

1. Refresher course in *Disaster Management (ID)*, at Human Resource Development Centre, Guru Nanak Dev University, during Nov. 26-Dec. 16, 2015.
2. Refresher course in *Environment Sciences (ID) (RC99)*, at Academic Staff College, Guru Nanak Dev University, during Nov. 19-Dec. 09, 2013.
3. *ISL-Numerical Analysis* held at Department of Mathematics, Panjab University, Chandigarh, during June 9-28, 2014.
4. Instructional school for Lecturers (ISL) on *Differential Equations and Computations* sponsored by NBHM, held at Jaypee University of Information Technology, Waknaghat, Solan, during June 04-16, 2012.
5. General orientation course GOC88, at Academic Staff College, Guru Nanak Dev University, during May 2-29, 2012.
6. Advanced Training in Mathematics for Lecturers (ATML) in *Calculus and differential geometry* sponsored by NBHM, held at Indian Statistical Institute Kolkata, during November 28-Dec 10, 2011.
7. Mathematics Training and Talent Search Programme (MTTS-Level O) held at the Department of Mathematics, Panjab University, Chandigarh, during May 27-June 30, 2007.

Applied Mathematics and Computation  
Acta Mechanica

Membership American Mathematical Society (AMS)  
Ramanujan Mathematical Society (RMS), (Life membership # 1066 since Feb. 2015)

### Visits abroad

2015 Beijing, China  
2010 University of Warwick, United Kingdom  
2007 ETH Zürich and University of Zürich, Switzerland

### Ph.D. Thesis Guided

2010-2017 Puneet Kaur  
Title of thesis *Patterns in Temperature modulated Rayleigh Bénard Convection*(Submitted)

### Teaching

M.Sc. Real Analysis I, II  
Algebra I, Group theory  
Topology  
Calculus of several variables  
Analytic number theory  
Topological vector spaces  
Differential geometry

Under grad. Calculus  
Fourier series and integral transforms  
Partial differential equations

### Technical skills

Expertise 

- o MS Office
- o MATLAB programming
- o Mathematica
- o LaTeX typeset, Beamer

### Awards

2015 Selected as UGC-Assistant Professor in Mathematical Sciences by UGC under the prestigious *Faculty Recharge Programme*

2015 Travel grant by NBHM to attend International Congress of Industrial and Applied Mathematics (ICIAM 2015) in Beijing, China.

2010 Visiting Fellowship (short one month visit), sponsored by the *Royal Academy of Engineering, United Kingdom*, in University of Warwick, during June 26-July 15.

2007 IISc PDF.

2007 NBHM PDF.

2007 Best paper presentation award in the section of Mathematics in the 1st Chandigarh Science Congress held during March 10-11.

- 2007 Travel grant by NBHM to attend the International Congress of Industrial and Applied Mathematics (ICIAM 2007), in Zürich, Switzerland, during July 16-20.
- 2005-2007 SRF-UGC National Fellowship in Mathematical Sciences.
- 2004 JRF-UGC National Fellowship in Mathematical Sciences.
- 2000 Gold Medal and a Merit Certificate by the Organization, Himotkarsh, Una, for standing first in B.Sc. in Himachal Pradesh University Shimla.
- 1998-2000 Prizes by Rotary International, Kangra, for standing first in B.Sc. I, II, III in Himachal Pradesh University Shimla.
- 2000 Gold Medal and a Merit Certificate for standing first in B.Sc. in Himachal Pradesh University Shimla.
- 1997-2000 State level Scholarships during the three years of B.Sc.

## Academic references

- Ph.D. Renu Bajaj  
 Supervisor Professor  
 Department of Mathematics  
 Panjab University Chandigarh, INDIA  
 renubajaj20012000@yahoo.com
- PDF Mentor B. S. Majumder  
 Professor (retired)  
 Physics and Applied Mathematics Unit (PAMU)  
 Indian Statistical Institute Kolkata, INDIA
- My Colleague Parminder Singh  
 Professor  
 Department of Mathematics  
 Guru Nanak Dev University Amritsar, Punjab, INDIA  
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- Field expert Sushil K. Tomar  
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 Department of Mathematics  
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 sktomar66@gmail.com
- Field expert N. Rudraiah  
 FASc, FNASc, FNA, FIAM(UK), FUWA(INDIA)  
 Life time Professor of Mathematics  
 Bangalore University  
 rudraiah@hotmail.com