ZAKIR HUSAIN DELHI COLLEGE
(University of Delhi)

Faculty Details

(Please Fill the form and Email it to website@zh.du.ac.in)

Title	**First Name**	**Last Name**	
Dr.	Vinay	Kumar	
Designation	Associate Professor		
Address	B-1202, Arihant Arden, Sector 1, Greater Noida West, Uttar Pradesh, Pin-203207		
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Educational Qualification

Degree	**Institution**	**Year**
B.Sc. (Hons.) Mathematics	Vinoba Bhave University	1998
M.Sc. (Mathematics)	University of Delhi	2002
Ph.D. (Mathematics)	University of Delhi	2017
NET	CSIR	2004

Career Profile

1. Associate Professor, Department of Mathematics, Zakir Husain Delhi College: 23-08-2020 to till date.
2. Assistant Professor, Department of Mathematics, Zakir Husain Delhi College: 14-09-2010 to 22-08-2020.
3. Assistant Professor, Department of Mathematics, ARSD College: 16-07-2009 to 13-09-2010.
4. Assistant Professor, Department of Mathematics, Hindu College: 14-01-2008 to 22-01-2009.
5. Assistant Professor, Department of Mathematics, Lakshmibai College: 01-11-2006 to 12-01-2008.

6. Assistant Professor, Department of Mathematics, I.P College for Women: 12-08-2005 to 30-04-2006.
7. Assistant Professor, Department of Mathematics, SGTB Khalsa College: 19-01-2005 to 23-03-2005.

Administrative Assignments

Worked as Convener (Time Table Committee), Worked as members of various committees like Canteen Committee, Research committee, NSS etc.,

Areas of Interest / Specialization

Celestial Mechanics and Space Dynamics, Nonlinear Dynamics

Subjects Taught

Real Analysis, Abstract Algebra, Linear Algebra, Numerical Analysis, Group Theory, Document Preparation and Presentation Software (Latex), Programming in Numerical methods through Mathematica.

Research Guidance

Supervision of Doctoral Thesis, under progress: 03

- Sawan Kumar Marig, Department of Mathematics, University of Delhi, Delhi, India. (Pursuing)
- Nitesh Kumar, Department of Mathematics, University of Delhi, Delhi, India. (Pursuing)
- Suneel Kumar Bairwa, Department of Mathematics, University of Delhi, Delhi, India. (Pursuing)

Publications Profile

1. **Kumar, Vinay**, and Nitesh Kumar. "Investigating Attraction Zones in the Photogravitational Four-Body Problem: Effects of Asteroid Belt and Small Perturbations in Coriolis and Centrifugal Forces." *Kinematics and Physics of Celestial Bodies* 40, no. 2 (2024): 88-104. Impact Factor: 0.5, ISSN: 1934-8401.
2. **Kumar, V.**, R. Aggarwal, and S. K. Marig. "Unveiling the intricacies of attracting zones in magnetic binary systems: Investigating the impact of Yukawa correction." *Astronomy and Computing* (2023): 100783. Impact Factor: 1.9. ISSN: 2213-1337.
3. **Kumar, Vinay**, and Sawan Kumar Marig. "Perturbations in Coriolis and Centrifugal Forces and NR Basins of Convergence of Photogravitational Magnetic-Binary Problem with Variable Mass." *Kinematics and Physics of Celestial Bodies* 39, no. 6 (2023): 325-341. Impact Factor: 0.5, ISSN: 1934-8401.
4. **Kumar, Vinay**, and Nitesh Kumar. "Unveiling the attracting regions in photogravitational four-body problem including the effect of asteroids belts." *Astronomy Reports* 67, no. 6 (2023): 667-683. Impact Factor: 1.1, ISSN: 1063-7729.

5. **Kumar, Vinay**, and Sawan Kumar Marig. "Effect of variable mass on N–R basins of convergence in photogravitational magnetic binary problem." *Astronomy Reports* 67, no. 2 (2023): 194-208. Impact Factor: 1.1. ISSN: 1063-7729.
6. Yadav, Sushil, Mukesh Kumar, **Vinay Kumar**, and Pravata Kumar Behera. "Stability analysis of Lagrangian points of geo-synchronous satellite including the resistive force and earth's equatorial ellipticity." *New Astronomy* 97 (2022): 101887. Impact Factor: 1.9, ISSN: 1384-1076.
7. Idrisi, M. Javed, M. Shahbaz Ullah, and **Vinay Kumar**. "Elliptic restricted synchronous three-body problem (ERS3BP) with a mass dipole model." *New Astronomy* 82 (2021): 101449. Impact Factor: 1.9, ISSN: 1384-1076.
8. **Kumar, Vinay**, M. Javed Idrisi, and M. Shahbaz Ullah. "Unpredictable basin boundaries in restricted six-body problem with square configuration." *New Astronomy* 82 (2021): 101451. Impact Factor: 1.9, ISSN: 1384-1076.
9. **Kumar, Vinay**, Md Arif, and M. Shahbaz Ullah. "Capricious basins of attraction in photogravitational magnetic binary problem." *New Astronomy* 83 (2021): 101475. Impact Factor: 1.9, ISSN: 1384-1076.
10. **Kumar, Vinay**, Rajiv Aggarwal, Pankaj Sharma, and Bhavneet Kaur. "Fractal basins of attraction in a binary quasar model." *New Astronomy* 84 (2021): 101543. Impact Factor: 1.9, ISSN: 1384-1076.
11. Ullah, M. Shahbaz, M. Javed Idrisi, and **Kumar, Vinay**. "Elliptic Sitnikov five-body problem under radiation pressure." *New Astronomy* 80 (2020): 101398. Impact Factor: 1.9, ISSN: 1384-1076.
12. **Vinay Kumar**, Pankaj Sharma, Rajiv Aggarwal, Sushil Yadav, and Bhavneet Kaur. "The unpredictability of the basins of attraction in photogravitational Chermnykh's problem." *Astrophysics and Space Science* 365, no. 6 (2020): 101. Impact Factor: 1.8. ISSN: 1572-946X.
13. Yadav, Sushil, **Vinay Kumar**, and Rajiv Aggarwal. "Existence and stability of equilibrium points in the problem of a geo-centric satellite including the earth's equatorial ellipticity." *Nonlinear Dynamics and System Theory* 19, no. 4 (2019): 537-550. ISSN: 537-550.
14. Kumar, Dinesh, Bhavneet Kaur, Shipra Chauhan, and **Vinay Kumar**. "Robe's restricted three-body problem when one of the primaries is a finite straight segment." *International Journal of Non-Linear Mechanics* 109 (2019): 182-188. Impact Factor: 2.8, ISSN: 1878-5638.
15. **Vinay Kumar**, Beena R. Gupta, and Rajiv Aggarwal. "Numerical simulation of the phase space of Jupiter-Europa system including the effect of oblateness." *Applications and Applied Mathematics: An International Journal (AAM)* 12, no. 1 (2017): 31. ISSN: 1932-9466.
16. Hassan, M. R., Md Aminul Hassan, Payal Singh, **Vinay Kumar**, and R. R. Thapa. "Periodic Orbits of the First Kind in the Autonomous Four-body Problem with the Case of Collision." *International Journal of Astronomy and Astrophysics* 7, no. 02 (2017): 91. Impact Factor: 1, ISSN: 2161-4725.
17. **Vinay Kumar,** Beena R. Gupta, and Rajeev Aggarwal. "Numerical Investigation of a Star's Trajectory in Binary Quasar System." *Advanced Studies in Contemporary Mathematics* 26, no. 3 (2016): 385-400. ISSN: 12293067.
18. Gupta, Beena R., and **Kumar, Vinay**. "Characterization of the phase space structure of circular restricted three-body problem: An alternative approach." *International Journal of Bifurcation and Chaos* 26, no. 02 (2016): 1650029. Impact Factor: 1.9, ISSN: 1793-6551.
19. Gupta, Beena R., and **Kumar,Vinay**. "Time-frequency analysis of asymmetric triaxial galaxy model including effect of spherical dark halo

component." *International Journal of Astronomy and Astrophysics* 5, no. 02 (2015): 106. ISSN: 2161-4725.

Book Authored

1. Yadav, Sushil & Aggarwal, Rajiv & **Kumar, Vinay**. (2020). A Study of Resonance Problems in a Geo-Synchronous Satellite. Lambert Academic Publishing, ISBN: 978-620-0-30172-7

Conference Organization/ Presentations (in the last five years)

1. Chaired a session in the International Conference on Mathematics and it's Applications in Science and Technology (ICMAST- 2024) jointly organized by Central University of Punjab, Shri Ram Murti Smarak College of Engineering & Technology and Pondicherry University, India during August 30-3, 2024
2. Attended a short-term course on Dynamical systems: Theory and applications held at department of applied mathematics, ISM, Dhanbad form June 26th -30th, 2016
3. Participated and presented a paper entitled "Poincare Surfaces of Section (PSS) along with Time- frequency Analysis (TFA)" in the International Conference on Celestial Mechanics & Dynamical Astronomy, held at Maulana Azad National Urdu University, from December 13th-17th, 2015
4. Participated and presented a paper entitled "Characterization of Particle's Trajectory in Sun- Jupiter-Satellite System" in the International Conference organized by Indian Society of Industrial and Applied Mathematics (Sharda University), from January 29th-30th, 2016.
5. Participated and presented a paper entitled "Classifying Orbits in the Circular Restricted Three Body Problem" in the National Conference in Algebra, Analysis, Coding and Cryptography held at University of Delhi, from October 14th-15th 2016
6. Participated and presented a paper entitled "Evolution of Basin and Existence of Fractal Basin" in the ICPST 2019, held at Deshbandhu College, University of Delhi, from January 17th-19th, 2019
7. Participated and presented a paper entitled "Measure of Uncertainty in Basins of Convergence" in the International Conference on Nonlinear Systems and Dynamics, held at IIT Kanpur, from 12th-15th December 2019
8. Delivered an invited lecture entitled "Analysis of Nonlinear Dynamical Systems Using Wavelet Ridges" in the International Conference on Current Trends in Theoretical and Computational Differential Equations with Applications, held at South Asian University, Delhi on.
9. Participated and presented a paper entitled "Time- Frequency Analysis of Restricted Three Body Problem" in the National Seminar for Research Scholars, held at University of Delhi, from
10. Delivered an invited lecture entitled "Simulation of Mathematical Models using Mathematica" in the National Workshop on Mathematical Modelling using Mathematica, held at Sharda University from 9th -13th April 2019.

Refreshers and Orientations:

1. Participated in refresher course from **2nd January 2013 to 22nd January 2013** organized by **CPDHE-Delhi**
2. Participated in 115th four-week orientation programme organized by the **UGC-HRDC, Jamia Millia Islamia**, New Delhi from 27th April to 25th May 2016

3. Participated in 01st four-week refresher programme organized by the **UGC-HRDC, Jamia Millia Islamia**, New Delhi from 29th August to 19th September 2018
4. Participated in two-week faculty development programme entitled "e-learning, pedagogy and ICT tools in higher education" organized by **Guru Anag Dev Teaching Learning center of MHRD, SGTB Khalsa college**, University of Delhi form 26th November -7th December 2018

Research Projects (Major Grants/Research Collaboration)

Awards and Distinctions

Association With Professional Bodies

- Life Member of Indian Science Congress Association
- Life Member of Indian Mathematical Society
- Life Member of Ramanujan Mathematical Society
- Life Member of Indian Society of Industrial and Applied Mathematics
- Junior member of International Astronomical Union

Other Activities

1. Organized a national workshop entitled 'Mathematical Modelling and Computational Techniques using Mathematica' at Zakir Husain Delhi College from 30th -31st march 2017