

CURRICULUM - VITAE

Dr. Ram Kishor

Assistant Professor

IUCAA Visiting Associate

(1st tenure, 01.08.2016 to 31.07.2019)

(2nd tenure, 01.08.2019 to 31.07.2022)

(3rd tenure, 01.08.2022 to 31.07.2025)

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Ph.D. DETAILS

Ph.D. Thesis Title: A Study of Effective Stability in the Generalised Photogravitational Chermnykh-like Problem.

Supervisor: Dr. Badam Singh Kushvah, Associate Professor, IIT (Indian School of Mines), Dhanbad (India)

Date of Ph.D. Award: March, 2014

Ph.D. Awarding Institute: IIT (Indian School of Mines), Dhanbad, Jharkhand, India

RESEARCH AREA

- ❖ Celestial Mechanics; Nonlinear Dynamics and Chaos; Mission Design.

RESEARCH INTEREST

- ❖ Celestial Mechanics, Nonlinear Dynamics and Chaos, and Mission Design etc.

RESEARCH AND ACADEMIC EXPERIENCES

- ❖ **Supervised 43 major and 15 minor, research project reports** for M.Sc. Maths (2Y), and M.Sc. Tech. Maths (3Y), Int. M.Sc. B.Ed. Maths/Phy (3Y) and Int. M.Sc. Maths (5Y) students at Central University of Rajasthan.
- ❖ **Supervised 5 students of Amity University Haryana (Gurgaon)** in their summer internship and evaluated their reports.
- ❖ (i) **Supervised 3 PhD students**, (ii) Supervision going on for 2 other Ph.D. students.

SPONSORED/CONSULTANCY PROJECTS

- ❖ PI of the project entitled “**Libration Orbits Mission Design with Perturbations**” sponsored by UGC under **UGC Start-up Grant No. F.30-356/2017 (BSR)** (Status: Completed).
- ❖ Co-PI of the project entitled “**Roll of escaping sets in complex dynamics**” sponsored by DST-SERB under EMR scheme (Status: Completed).

TEACHING EXPERIENCES

Assistant Professor in the Department of Mathematics, Central University of Rajasthan, **from last 10 years** as below-

- ❖ 23 September 2013 to 22 September 2014 (**Temporary**)
- ❖ 24 September 2014 to 22 September 2015 (**Temporary**)
- ❖ 24 September 2015 to 18 December 2015 (**Temporary**)
- ❖ 21 December 2015 to till date (**Regular**)

REVIEWER/REFREE

- ❖ Scientific Reports, Nature
- ❖ Advances in Space Research (ASR), Elsevier
- ❖ Chaos, Solitons & Fractals, Elsevier
- ❖ Results in Physics, Elsevier
- ❖ Indian Journal of Physics, Springer
- ❖ Astrophysics and Space Science (Ap&SS), Springer
- ❖ The Journal of the Astronautical Sciences (JASS), Springer
- ❖ Advances in Astrophysics (AdAp), Isaac Scientific Publishing.
- ❖ International Frontier Science Letters (IFSL), SciPress Ltd.

SUBJECT TAUGHT

- ❖ Real Analysis
- ❖ Numerical Analysis
- ❖ Classical Mechanics
- ❖ Celestial Mechanics
- ❖ Complex Analysis
- ❖ Functional Analysis,
- ❖ Number Theory
- ❖ Research Methodology
- ❖ Abstract Algebra
- ❖ Discrete Mathematics
- ❖ Algebra and Analysis
- ❖ Sets and Functions
- ❖ Vectors and Matrices
- ❖ Differential and Integral Calculus

MEMBERSHIPS IN PROFESSIONAL/SCIENTIFIC ORGANIZATIONS

- ❖ Life member of '**Indian Science Congress Association (ISCA)**', Kolkata, **India**.
- ❖ Life member of '**Indian Mathematical Society (IMS)**', Maharashtra, **India**.
- ❖ Life member of '**Ramanujan Mathematical Society (RMS)**', Tiruchirapalli, **India**.
- ❖ Life member of '**Astronomical Society of India (ASI)**', Bangalore, **India**.
- ❖ Visiting Associate of **Inter-University Centre for Astronomy and Astrophysics (IUCAA)**, Pune, India (1st tenure 01.08.2016 to 31.07.2019, 2nd tenure 01.08.2019 to 31.07.2022 and 3rd tenure 01.08.2022 to 31.07.2025)
- ❖ Life member of '**Society of Applied Mathematics (SAM)**', ISM Dhanbad, **India**
- ❖ Sectional Committee Member for the section: **Mathematical Sciences (including Statistics)**, ISCA, Kolkata, 2018.
- ❖ Member of School board for the school of MSCS at Central University of Rajasthan
- ❖ Associate of **Committee on Space Research (COSPAR)**, ZARM COSPAR, Paris, France.
- ❖ Member of '**International Association of Engineers (IAE)**', Hong Kong.
- ❖ Member of '**International Astronomical union (IAU)**', France.
- ❖ Member of '**Society of Industrial and Applied Mathematics (SIAM)**', USA (May 2013-December 2014).

EDUCATIONAL QUALIFICATION

- ❖ Ph.D. in 2014 in Celestial Mechanics from IIT (Indian school of Mines), Dhanbad, Jharkhand, India.
- ❖ B.Ed. in 2009 with first division from Digamber Jain College Baraut, Baghpat of CCS Univ. Meerut, U. P., India.
- ❖ M.Sc. in 2008 in Mathematics with first division from University of Allahabad, Prayagraj (Allahabad), U.P. India.
- ❖ B.Sc. in 2006 with Physics, Chemistry and Mathematics with second division from Ewing Christian College, Prayagraj (Allahabad) (An Autonomous College of University of Allahabad), U.P. India.

HONOURS/AWARDS

- ❖ Selected as **Visiting Associate** of IUCAA (1st tenure 01.08.2016 to 31.07.2019, 2nd tenure 01.08.2019 to 31.07.2022 and 3rd tenure 01.08.2022 to 31.07.2025) under the visiting associateship programme of IUCAA, Pune (Maharashtra), India.
- ❖ Won the **Best Poster Award of worth Rs. 5000/- Cash and Citation in 105th ISCA 2018** at Manipur University, Imphal, Manipur, during 16-20 March, 2018
- ❖ **Elected as Sectional Committee Member** for the section: Mathematical Sciences (including Statistics), ISCA, Kolkata, 2018
- ❖ Felicitated by Central University of Rajasthan on the occasion of 6th foundation day (3rd March 2014) for a **research paper** published in **Monthly Notices of the Royal Astronomical Society (Impact Factor 5.521, 2013)** published by **Oxford University Press, London**.
- ❖ CSIR-UGC NET (LS): (i) June 2009 with 52 rank, (ii) Dec. 2009 with 95 rank
- ❖ GATE 2012 : AIR 383

ORGANISED WORKSHOPS/CONFERENCES/SEMINAR

- ❖ Organised **National Mathematics Day Seminar**, 22 December, 2023 at the Dept. of Mathematics, Central Univ. of Rajasthan.
- ❖ Organised IUCAA sponsored 3 day **International Workshop on Celestial Mechanics and Dynamical Astronomy (IWCMDA2023)**, 06-08 January, 2023 at the Department of Mathematics, Central University of Rajasthan.
- ❖ Organised IUCAA sponsored 5 day workshop on **Celestial Mechanics and Dynamical Astronomy (CMDA2019)**, 07-11 January, 2019 at the Department of Mathematics, Central University of Rajasthan.

ABROAD VISIT

- ❖ Presented a paper during **40th COSPAR Scientific Assembly**, held at **Moscow, Russia** during August 2-10, 2014.
- ❖ Presented a paper during **SIAM Conference on Applications of Dynamical System**, held at **Snowbird, Utah, USA**, during 19-23 May, 2013.

DELIVERED TALKS IN WORKSHOP/SEMINAR

- ❖ On the **Impact of a disc/belt in the generalized photo-gravitational RTBP** in online workshop on "Recent Development of Mathematical Sciences on Biological and Dynamical Systems with Fuzzy and Fractional Environment" at Department of Mathematics, Mahadevananda Mahavidyalaya Barrackpur, Kolkata during 19th-29th July 2024.
- ❖ On the **Most Celebrated Unsolved Problem of Celestial Mechanics** in one-day national webinar '**Recent Progress in Mathematical Sciences**' on the occasion of International Day of Mathematics at the Department of Mathematics, Government Engineering College Bhojpur, Bihar on March 14, 2024.
- ❖ On the **Most Celebrated Unsolved Problem** in the **National Mathematics Day** seminar at the Department of Mathematics, Central University of Rajasthan on 22nd December, 2023.
- ❖ On the **Existence analysis of Lagrange point-L1, stability analysis and possible application in different space missions** in the **Meghnad Saha Memorial Workshop on Solar Astronomy Focused one Aditya-L1 Mission** held at Dept. of Physics, University of Allahabad, UP during 4-6 December, 2023.
- ❖ On the **Generalised Photo-gravitational RTBP with Disc** in the **29th CONIAPS** at the Department of Applied Sciences, Shivalik College of Engineering, Dehradun during 21-23 July, 2023.
- ❖ On the **Introduction to Different Physical Models and their Dynamical Aspects** in **IWCMDA2023** at the Department of Mathematics, Central University of Rajasthan during 06-08 January, 2023.
- ❖ On the **Most Celebrated Problem of the Celestial Mechanics- An Unsolved Problem** in the **Webinar** on Cosmology & Astronomy: Study of the Universe using Physics and Mathematics held at The Neotia University, Sarisha, West Bengal during 04 September, 2021.
- ❖ On the **Restricted Problem of Three Bodies: An Unsolved Problem** in the **National Webinar** on "Tourism in Space: A Mathematical Overview" at Galgotias College of Engineering and Technology, Greater Noida,, during 03 September, 2020.
- ❖ On the **Normalisation Methods** in **CMDA-2019** held at Department of Mathematics, Central University of Rajasthan, Ajmer, Rajasthan (India) during 07-11 January, 2019.
- ❖ On the **Restricted Three body Problem** in **RMSET-2016** held at Department of Mathematics, MNNIT, Prayagraj (Allahabad), UP (India) during 19-23 October, 2016.
- ❖ On the **Chermnykh-Like Problem** in **RMSET-2016** held at Department of Mathematics, MNNIT, Prayagraj (Allahabad), UP (India) during 19-23 October, 2016.
- ❖ On the **Lyapunov Characteristic Exponents** in **RMSET-2016** held at Department of Mathematics, MNNIT, Prayagraj (Allahabad), UP (India) during 19-23 October, 2016.

SCHOOL/WORKSHOP/SEMINAR/LIBRARY VISITS

- ❖ Attended a **two-week, online capacity-building programme** on "National Education Policy Orientation & Sensitization" held at MMTTCC, IUCAA (Online) during 1-15 May, 2024.
- ❖ Attended a **Two week Faculty Development Program** on "Deep Learning in Image Processing and Pattern Recognition" held at Central University of Rajasthan during 13-22 March, 2023.
- ❖ Attended a five days' **One week online FDP** on "NEP 2020: Impetus for Life Skills and Holistic Development" for teachers of HEIs held at Central University of Rajasthan during 01-05 March, 2021.
- ❖ Attended a ten days' **refresher course on Capacity Building Program for teachers of HEIs** held at Central University of Rajasthan during 09-19 April, 2019.
- ❖ Attended a ten days workshop on **Teaching-Learning & Evaluation for faculty members of HEIs** held at Central University of Rajasthan during 15-24 December, 2018.
- ❖ Attended two day **Microsoft Faculty Empowerment Training Program "Saksham"** held at Central University of Rajasthan during 10-11 March, 2018.
- ❖ Presented (poster) under **Best Poster Award Programme** of **ISCA 2018** during 16-20 March, 2018 at Manipur University, Imphal, Manipur.
- ❖ Participated and completed **115th Orientation Programme** during 04-31, January, 2017 held at UGC-HRDC, University of Allahabad, Allahabad, U. P.

- ❖ Chaired a session in the national workshop on **Mathematical Modelling and Simulation**, held at Central Univ. of Rajasthan during 14-18 March, 2016.
- ❖ Attended (member of organising committee) **ICOCBASD-2015**, held at Central Univ. of Rajasthan during 20-22 March, 2015.
- ❖ Attended **DST-SERC School on Nonlinear Dynamics**, held at Central University of Rajasthan during 01-20 December 2014.
- ❖ Attended **NCCA-2014**, held at Central University of Rajasthan during 08-09 March, 2014.
- ❖ Attended **WMMA-2013** as a Volunteer and Participant, held at ISM Dhanbad during 07-09 February, 2013.
- ❖ Attended **5th Science Conclave** held at IIT, Allahabad during December 8-14, 2012.
- ❖ Attended **UTPLAA-2012** as a Super Visor of under Graduated Student in problem solving, held at ISM Dhanbad for the duration of 28 May to 6 June, 2012.
- ❖ Attended **Inspire Science Camp-2012** as a Volunteer, held at ISM Dhanbad, for the duration of 20-24 March, 2012.
- ❖ Visitor of **IUCAA**, Pune since May, 2011 to 2016.

LIST OF PUBLICATIONS

- ❖ Pulkit Gahlot and **Ram Kishor**, "Invariant manifolds of Lyapunov periodic orbits in the RCD solar sail problem with dipole secondary", *Nonlinear Dynamics (Springer)*, Vol. 112, Page 14143-14157 (2024).
- ❖ Pulkit Gahlot and **Ram Kishor**, "Orbital analysis in generalised solar sail problem with Stokes drag effect", *Indian Journal of Physics (Springer)*, (2024) <https://doi.org/10.1007/s12648-024-03192-6>
- ❖ Poonam Meena and **Ram Kishor**, "On the periodic motion in the photo-gravitational planar elliptic restricted four body problem", *Chaos, Solitons & Fractals (Elsevier)*, Vol. 180, 114525 (2024).
- ❖ Saleem Yousuf and **Ram Kishor** "Non-linear stability of triangular equilibrium points inn non-resonance case with perturbations", *Nonlinear Dynamics*, Vol. 112, Page 1843–1859 (2023).
- ❖ Saleem Yousuf, **Ram Kishor** and Manoj Kumar, "Motion about equilibrium points in the Jupiter-Europa system with oblateness", *Applied Mathematics and Nonlinear Sciences*, Vol. 8(1), Page 2075-2090 (2023)
- ❖ Pulkit Gahlot and **Ram Kishor**, "Artificial equilibrium points and their linear stability analysis in the solar sail problem with triaxial second primary", *Advances in Space Research*, Vol. 71(8), Page 3262-3280 (2023).
- ❖ Saleem Yousuf, and **Ram Kishor**, "2D and 3D axi-symmetric horseshoe periodic orbits about Lagrangian points: A global grid search approach", *Icarus*, Vol. 387, 115207 (2022).
- ❖ Poonam Meena and **Ram Kishor**, "Floquet stability analysis of equilibrium points and numerical exploration of pulsating zero-velocity curves and Newton-Raphson basins of attraction", *Advances in Space Research*, Vol. 70(8), Page 2334-2356 (2022).
- ❖ Saleem Yousuf, and **Ram Kishor**, "Families of periodic orbits about Lagrangian points L₁, L₂ and L₃ with continuation method", *Planetary and Space Science*, Vol. 217, 105491 (2022).
- ❖ Saleem Yousuf and **Ram Kishor** , "Impact of a disc and drag forces on the existence and linear stability of equilibrium points and Newton-Raphson basins of attraction", *Kinematics and Physics of Celestial bodies*, Vol. 38 (3), Page 166–180, (2022).
- ❖ Poonam Meena and **Ram Kishor**, "First order stability test of equilibrium points in the planar elliptic restricted four body problem with radiating primaries", *Chaos, Solitons and Fractals (Elsevier)*, Vol. 150,111138 (2021).
- ❖ Ashok Kumar Pal, Elbaz I. Abouelmagd and **Ram Kishor**, "Effect of Moon perturbation on the energy curves and equilibrium points in the Sun–Earth–Moon system", *New Astronomy (Elsevier)*, Vol. 84,101505 (2020).
- ❖ Saleem Yousuf and **Ram Kishor**, "Effects of the albedo and disc on the zero velocity curves and linear stability of equilibrium points in the generalized restricted three-body problem", *Monthly Notices of the Royal Astronomical Society*, Vol. 488(2), Page 1894-1907 (2019).
- ❖ **Ram Kishor**, M. Xavier James Raj and Bhola Ishwar "Normalization of Hamiltonian and nonlinear stability of triangular equilibrium points in the photogravitational restricted three body problem with P-R drag in non-resonance case", *Qualitative Theory of Dynamical Systems (Springer)*, Vol.18(3), Page1055-1075 (2019).
- ❖ **Ram Kishor** and Badam Singh Kushvah, "Normalization of Hamiltonian and Nonlinear Stability of the Triangular Equilibrium Points in Non-resonance Case with Perturbations", *Astrophysics & Space Science (Springer)*, Vol.362, 156 (2017)
- ❖ **Ram Kishor** and Badam Singh Kushvah, "The Linear Stability of Collinear Equilibrium Points and Resonances", *Advances in Astrophysics*, Vol. 2(1), Page 52-65 (2017).

- ❖ **Ram Kishor**, “**Linear Stability of Equilibrium Points in the restricted three body problem with Perturbations**”, **Journal of IAPS**, Vol. 20(1), Page 1-16, (2016).
- ❖ **Ram Kishor** and **Badam Singh Kushvah**, “**Triangular Equilibrium points and its Linear Stability in the Generalized Photo-gravitational Chermnykh-Like Problem with Power-law Profile**”, Published in proceedings of National Conference on ‘Recent Advances in Mathematics and its Applications’ (**Allied Publishers, Pvt. Ltd.**) Page 238-246 (2013).
- ❖ **Ram Kishor** and **Badam Singh Kushvah**, “**Linear Stability and Resonances in the Generalized Photogravitational Chermnykh-Like Problem with a Disk**”, **Monthly Notice of Royal Astronomical Society (Oxford University Press)** Vol. 436, Page 1741-1749 (2013).
- ❖ **Ram Kishor** and **Badam Singh Kushvah**, “**Lyapunov Characteristic Exponents in the Generalized Photo-gravitational Chermnykh-Like Problem with Power-law Profile**”, **Planetary and Space Science (Elsevier)** Vol. 84, Page 93-101 (2013).
- ❖ **Ram Kishor** and **Badam Singh Kushvah**, “**Periodic Orbits in the Generalized Photo-gravitational Chermnykh-Like Problem with Power-law Profile**”, **Astrophysics & Space Science (Springer)**, Vol. 344(2), Page 333-346 (2013).
- ❖ **Badam Singh Kushvah**, **Ram Kishor** and **Uday Dolas**, “**Existence of equilibrium points and their linear stability in the generalized photogravitational Chermnykh-like problem with power-law profile**”, **Astrophysics & Space Science (Springer)**, Vol. 337(1), Page 115-127 (2012).

LIST OF ARTICLES PRESENTED IN NATIONAL/INTERNATIONAL CONFERENCES

- ❖ **Ram Kishor**, “**Computation of Lissajous and halo Orbits**” presented a research paper (online) in the **6th International Mediterranean Congress** held at Rome, Italy during 13-15 August 2024.
- ❖ **Ram Kishor** “**Non-linear Stability Analysis for Perturbed Non-collinear Equilibrium Points in Non-resonance Case**” presented (e-poster) a research paper in the **XXXII IAU General Assembly** held at Cape Town, South Africa during 6-15 August, 2024.
- ❖ **Ram Kishor**, “**On the Lissajous and Halo Orbits with Oblate Primaries**”, presented in the **PTS-2023** held at Department of Physics, JNU, New Delhi during 21-23 September, 2023.
- ❖ **Ram Kishor**, “**Nonlinear stability analysis of triangular equilibrium points with P-R drag**”, presented in the **ICCMO-2022** held (online) at Department of Applied Sciences, The North Cap University, Gurugram, Haryana during 02-03 April, 2022.
- ❖ **Ram Kishor**, “**Existence and linear stability analysis of collinear equilibrium points in the generalised Chermnykh-like problem with radiation pressure and a disc**”, presented in the **35th annual conference of RMS-2020** held (online) at Central University of Rajasthan during 27-29 December, 2020.
- ❖ **Ram Kishor**, “**Lyapunov Characteristics Exponents in the perturbed restricted three body problem**”, presented in the **CDSA-2020** held at Central University of Rajasthan during 21-23 February, 2020.
- ❖ **Ram Kishor**, “**Effect of radiation and P-R drags on the equilibrium points and zero velocity curves in the restricted three body problem**”, presented in the **2nd ICMMAAC-2019** held at JECRC University, Jaipur, Rajasthan during 08-10 August, 2019.
- ❖ **Ram Kishor**, “**Computation of Complex Normal Form in the Spatial Photogravitational Restricted Three Body Problem with Oblate Primaries**” presented in the **Best Poster Award Programme of ISCA 2018** held at Manipur University, Imphal, Manipur, during 16-20 March, 2018.
- ❖ **Ram Kishor**, “**Normalization of Hamiltonian in the Restricted Three Body Problem with Oblate Primaries**” presented in the **Competition Section in the 83rd Annual Conference of IMS - an International Meet** held at S V University, Tirupati, AP during 12-15 December, 2017.
- ❖ **Ram Kishor**, “**Normalization of Hamiltonian in the Chirmnykh-like Problem under the influence of Perturbations**” presented in **21st International Conference of International Academy of Physical Sciences (CONIAPS XXI) on Symbiotic Development of Mathematical, Physical, Chemical & Computational Sciences** held at GJUS&T, Hisar, Haryana during 28-30 October, 2017.
- ❖ **Ram Kishor**, “**Lyapunov Characteristic Exponents in the Chermnykh-like Problem under the influence of Perturbations**”, presented in the **ICTIMAMS-2016**, held at DST Center for Interdisciplinary Mathematical Sciences, BHU Varanasi, India during December 14-17, 2016.

- ❖ **Ram Kishor**, “**Linear Stability of Equilibrium Points in the restricted three body problem with Perturbations**, presented in the **18th International Conference of International Academy of Physical Sciences (CONIAPS XVIII) On Recent Trends in Physical Sciences**, held at University of Allahabad, Allahabad, UP during 22-24 December, 2015.
- ❖ **Ram Kishor**, “**Linear Stability in case of Resonances in the Photogravitational Restricted Three Body Problem with an Oblate Body**, presented in the **80th Annual conference of The Indian Mathematical Society**, held at ISM, Dhanbad during 27-30 December, 2014.
- ❖ **Ram Kishor**, “**Linear Stability of Equilibrium Points and Resonances in the Generalized Photogravitational Chermnykh-Like Problem with a Disc**”, presented in the **40th COSPAR Scientific Assembly**, held at **MOSCOW, Russia** during 02-10 August, 2014.
- ❖ **Ram Kishor**, “**Orbits in the Neighbourhood of Collinear Equilibrium Points in the Generalized Photogravitational Chermnykh-like Problem**” presented in International Conference on Advances in Dynamical System (**ICADS 2014**)” held at Central University of Rajasthan during March 10-13, 2014.
- ❖ **Ram Kishor** and Badam Singh Kushvah, “**Collinear Equilibrium Points and its Linear Stability in the Generalized Photogravitational Chermnykh-Like Problem with Power-law Profile**” presented in **SIAM Conference on Applications of Dynamical System (DS13)**” held at Snowbird Ski and Summer Resort, Snowbird, Utah, **USA** during May 19-23, 2013.
- ❖ **Ram Kishor** and Badam Singh Kushvah, “**Triangular Equilibrium points and its Linear Stability in the Generalized Photo-gravitational Chermnykh-Like Problem with Power-law Profile**” presented under **Young Scientist Award Session** in the National conference on ‘Recent Advances in Mathematics and Its Applications (**RAMA-2013**)’ held at Indian School of Mines, Dhanbad during, February 14-16, 2013”.
- ❖ **Ram Kishor** and Badam Singh Kushvah, “**Computation of First and Second Order LCEs in the Generalized Photogravitational Chermnykh – Like Problem**” presented in the **39th COSPAR Scientific Assembly (International)** at Mysore, India, during July 14-22, 2012.

DECLARATION

I do here by declare that the above furnished details are true and correct to the best of my knowledge and belief.

Date: August, 2024

(Ram Kishor)