Brief CV: Dr. Manoj Kumar Panda

Office Address:

Assistant Professor in Mathematics, PDPM Indian Institute of Information Technology, Design & Manufacturing Jabalpur, Madhya pradesh, India, Email: luna.iitk@gmail.com and mkpanda@iiitdmj.ac.in, Web: http://faculty.iiitdmj.ac.in/faculty/mkpanda ; Fax: (+91) 761-2632524, Mobile: 09425156319

Personal Information:

Date of Birth:14-06-1978, Birth place: Daspalla, Nayagarh, Odisha, India.

Communication (Postal) Address :

S/O: BINODA BIHARI PANDA; Village: HARIDABADI; Post: DASPALLA; District: NAYAGARH; State: ODISHA; Pin-752084; India

Awards & Fellowships:

- Selected as NBHM (National Board For Higher Mathematics) Postdoctoral Fellow, 2011 (Department of Atomic Energy, Government of India).
- Qualified Graduate Aptitude Test in Engineering (GATE-2003) for pursuing Ph.D. in Mathematics (Department of Higher Education, Ministry of Human Resource Development (MHRD), Government of India)

Academic Qualifications:

- Selected as UGC-Assistant Professor in Mathematical Sciences through **UGC-FRP (ID:FRP39356)**, 2015.
- NBHM Post-Doctoral Fellow: IISc Bangalore, India from 2011- 2013 [***Award No. 2/40(38)/2010-R&D-II/2238 dated 02/02/2011***].
- *Ph.D.* (Mathematics, 2011): Indian Institute of Technology, Kanpur. Thesis title: ``Some Problems on Phototactic Bioconvection",Thesis supervisor: Prof. S. Ghorai, IIT Kanpur.
- *M.Sc.* (Mathematics, 2000): Utkal University, Odisha, India, First division (70.08%).

Previous Experiences:

- **Assistant Professor in Mathematics:** IIITDM-Jabalpur, India (Sept. 2013-cont.)
- **Assistant Professor in Mathematics:** KIIT University,Odisha (April 2013-August 2013)

Research Interest:

APPLICABLE MATHEMATICS , Partial & Ordinary Differential Equations, Mathematical Modelling and Scientific Computing (Analytical & Numerical Study)

Research (Sponsered) Projects:

- "Bioconvection in a suspension of isotropically or anisotropically scattering phototactic algae exposed to both diffuse and collimated solar radiation or diffuse solar radiation only" 10 lakhs through Institute research initiation grant, PDPM IIITDM Jabalpur, India, 2014-15.

- **SERB GRANT VIA** Mathematical Research Impact Centric Support (MATRICS) SCHEME (SERB), **to the Project "Mathematical modelling of biased swimming micro-organisms via bioconvection"** Start Date : 18-12-2017 Expected Finish Date : 17-12-2020 Financial Outlay : 6.6 Lakhs

Selected Peer-reviewed Publications :

- Bioconvection in a suspension of isotropically scattering phototactic algae. S. Ghorai, **M. K. Panda,** and N. A. Hill. **Phys. Fluids 22**, (071901) 1–16, 2010 (American Institute of Physics, **ISSN:** 1070-6631, Impact Factor 2.32). https://doi.org/10.1063/1.3457163 (*16 pages*)

- Bioconvection in an anisotropic scattering suspension of phototactic algae. S. Ghorai and **M. K. Panda**. **European Journal of Mechanics–B/Fluids 41**, 81-93, 2013 (ELSEVIER, **ISSN:** 0997-7546, Impact Factor 1.696) http://dx.doi.org/10.1016/j.euromechflu.2012.07.001 (*13 pages*)

- Penetrative phototactic bioconvection in an isotropic scattering suspension,.**M. K. Panda** and S. Ghorai. **Phys. Fluids 25** (071902) 1-26, 2013 (**AIP**, **ISSN:** 1070-6631, Impact Factor 2.32) https://doi.org/10.1063/1.4813402 (*26 pages*).[***This Manuscript was published during the Postdoctoral research availed through NBHM Postdoctoral Fellowship at IISC Bangalore, India***; (Award No: 2/40(38)/2010-R&D-II/2238 dated 02/02/2011)]

- Effects of magnetic-field-dependent viscosity at onset of convection in magnetic nanofluids. M. Arora, R. singh & **M.K.Panda. Journal of Engineering mathematics, 101(1) 2016, ISSN: 1573-2703**, Impact Factor 1.04, **(**http://dx.doi.org/10.1007%2Fs10665-016-9855-9 **) (17pages)**

- Penetrative phototactic bioconvection in a two-dimensional non-scattering suspension, **M. K. Panda** & R. Singh. **Phys. Fluids 28**(054105) 1-23, 2016 (American Institute of Physics, **ISSN:** 1070-6631, Impact Factor 2.32) (http://dx.doi.org/10.1063/1.4948543) **(*22 pages*)**

- Effects of both diffuse and collimated incident radiation on phototactic bioconvection, **M. K. Panda**, R. Singh, A. C. Mishra and S. K. Mohanty, **Physics of Fluids**, 28 (124104) 1-29, **2016** (American Institute of Physics, **ISSN:** 1070-6631, Impact Factor 2.32) (http://dx.doi.org/10.1063/1.4972057) **(29 Pages)**

Preprints/under review publications:

- "Linear stability of gyrotactic plumes: rigid side wall," Applied Mathematics and computation, 2016 by R.Singh and **M. K. Panda** (**Under Process**)

Invited/Contributed Talks:

- "Onset of Phototactic Bioconvection in an Isotropic Scattering Suspension" at **TIFR-CENTRE FOR APPLICABLE MATHEMATICS**, BENGALURU, INDIA on 5th January-2015

- "Bioconvection in a planar layer of isotropically scattering phototactic algae exposed to both diffuse and non-diffuse (collimated) light intensity " at **IIT KANPUR, INDIA, in conference ICMCB-2015**, 28th Feb.-3rd Mar. 2015

Conferences/Workshops attended:

- National Symposium on Scientific Computing with Application to Partial Differential Equations, IIT Kanpur (India), Nov. 19-21, 2005.
- Indo-Australian workshop on CFD Approach on Fluid Flow, Heat and Mass Transfer and Symposium on CFD Applications in Multidisciplinary Areas, IIT Roorkee (India), April 12-14, 2007.

Teaching Interest:

Real Analysis, Complex Analysis, Linear Algebra, Fluid Mechanics, Numerical Analysis, Differential Equations,

Academic Experience:

Teaching Assistant, MTH 203N, Ordinary and Partial Differential Equations (B.Tech. Core Course, IIT Kanpur, India, 2007-2008, Odd Semester & 2008-2009, Odd Semester).

Computer Skills:

Fortran, C, C++, LATEX, Linux, Windows, Matlab.

Brief Description of Research Work Done:

Research Interests: I am interested in micro-organisms and their mathematical Modelling, in particular microscopic phototactic algae (e.g. Chalamydomonas Nivalis.). My research focuses on the new Mathematical physics required to understand swimmming micro-organisms, from single cells to populations. Herein, the swimmers self-propel and actively respond to environmental bias (gravity, flow, light, chemicals...), in contrast to the passive microscopic particles (e.g. colloids). Bio-convection, the process of spontaneous large scale convection in shallow layers of swimmer supsensions, is an appropriate classical example of it . As inspired by current challenging problems in sustainable bioengineering and environmental microbiology, the typical environments for the swimmers are tubes, channels and porous media and so on. I hope, the new physics of swimmers, and the application of physics via suitable mathematical models to such suspensions of micro-organisms in general, have the potential to improve promising bioengineering applications. My research concerns around such applications: I use a combination of mathematical modelling and numerical experiments to solve problems inspired by these applications.

References:

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Other Information:

I would like to convey that the journal manager of Physics of Fluids posted on the Physics of Fluids Facebook page one of my recent article entitled “Effects of both diffuse and collimated incident radiation on phototactic bioconvection” and the corresponding link is:
https://www.facebook.com/PhysicsofFluids/posts/1218175558261540