Biodata

Dr. Ratan Joarder
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Date of superannuation: 31-12-2044

1. Education

PhD, Aerospace Engineering, Indian Institute of Science, Bengaluru, 2009.
Master of Science (Engg.), Aerospace Engineering, Indian Institute of Science, Bengaluru, 2004.
Bachelor of Engineering, Mechanical Engineering, NIT (the then REC) Durgapur, 2001.

2. Professional Experience

May 08, 2019 – Present, **Associate Professor**, IIT Kharagpur, India.
July 2013 – May7, 2019, **Assistant Professor**, IIT Kharagpur, India.
April 2013 - June 2013, **Assistant Professor**, IIT Mandi, India.
May 2011 - March 2013, **Post-Doctoral Fellow**, DLR Stuttgart, Germany.
January 2010 - April 2011, **Scientist**, National Aerospace Laboratory, Bengaluru, India.
June 2001 – January 2002, **Trainee Engineer**, Sterlite Optical Technologies Ltd., Aurangabad, India.

3. Research areas

Combustion: Laser ignition, supersonic combustion, instability
High Speed Aerodynamics: Wave drag reduction, radiation heat transfer calculation, shock tunnels.
Computational Fluid Dynamics: Compressible Navier-Stokes equations, Large Eddy Simulation of reacting flows.

4. Teaching

UG core: Thermodynamics and Aerospace Propulsion, single/joint, autumn semesters, 2014-2020, Computer Applications in Aerospace Engineering, spring semesters, 2014 and 2015.
UG Elective: Combustion Processes in Jet Engines, spring semesters, 2014-2021.
PG core: Aircraft Propulsion, autumn semesters, 2013-2017, Aerodynamics, autumn semester, 2013 (joint).
PG. Elective: Combustion Processes in Jet Engines, spring semesters, 2014-2021.
PG Laboratory: Aerospace Laboratory, 2016-2021 (joint).
Outside IIT Kharagpur: Aerospace Propulsion, PGRPE program, National Aerospace Laboratories, Council of Scientific and Industrial Research, Bangalore, India, 01.08.2010-17.12.2010.

5. Students

Degree	Guidance	Number completed	Number in progress
Doctoral	Single	3	5

Doctoral	Joint	1	0
M. Tech/M. Tech (Dual)	Single	13	0
B. Tech	Single	17	0

6. Number of publications

Refereed journals (international)		Conference (international)	Conference (national)	Monograph
Published	Submitted			
18	01	08	03	01

7. Projects

Designation	Sponsored by	From	To	Status	Duration (months)	Project value (Lakh)
PI	SRIC, IIT Kharagpur (ISIRD)	05-05-2014	19-05-2017	Completed	36	28
PI	AR & DB	16-11-2016	03-01-2019	Completed	24	14.09
Co-PI	DST (FIST)	18-08-2015	17-07-2020	Completed	60	295
PI	SERB(Core Research Grant)	07-03-2020	06-03-2023	Ongoing	36	57.884

8. Laboratory development/Research contribution

i) Laser ignition facility in the department.
ii) Augmentation of the HPC cluster of the department by 5 additional nodes.
iii) Repair and re-installment of the gas supply in the ramjet facility for UG/PG students.
iv) Demonstration of supersonic combustion at the Indian Institute of Science, Bengaluru.

9. Organization of conference/short course in the department

i) NAPC 2018 (National Aerospace Conference) funded by NCABE, ISRO, GTRE etc.
ii) Offered 9 hours of lecture along with lecture notes and question papers on Aircraft Propulsion in the HAL training program held during May-July 2015.
iii) ICTACEM December 20-22, 2021, IIT Kharagpur

10. Administrative Responsibilities at IIT Kharagpur

i) Program officer in NSO Health and Fitness (Spring 2014-2015 to 31-07-2017).
ii) Assistant Warden in the MMM hall of residence (08-07-2017-December 2019).
iii) Faculty advisor for the UG students from 2014-2017 and currently serving the same responsibility for UG 1st year (M. Tech (Dual)) students.
iv) Laboratory in-charge, departmental computer laboratory, 2017.
v) Member, departmental purchase committee, January 2020-2022.
vi) Warden, VSRC (old), 2020-till date
vi) Departmental Examination-in-charge, 2022-till date
vii) Laboratory in-charge, departmental propulsion laboratory, 2022-till date.

11. Awards

i) National Scholarship.

ii) DLR-DAAD Fellowship (2011).

12. Major publications

i. High-speed photography and background oriented schlieren techniques for characterizing tulip flame *by* Joarder R., Choudhury S. P. Combustion and Flame 245 - (2022)

ii. Effects of non-collimated radiation during the decay of laser-induced spark *by* Vellala S.L., Joarder R. International Journal of Heat and Mass Transfer 190 - (2022)

iii. Flow-field alternation and wave drag reduction under repetitive laser energy deposition *by* Padhi U. P., Joarder R. **International Journal of Thermal Sciences** 179 - (2022)

iv. Insight into the evolution of laser-induced plasma during successive deposition of laser energy *by* Singh A.P., Padhi U.P., Joarder R. **Journal of Applied Physics** 131 - (2022)

v. On the radiative heat loss and axis-switching phenomena of a decaying laser spark *by* Joarder R., Vellala S. L., Singh A. P., Syam S. , Padhi U. P., Choudhury S. P. Plasma Sources Sci. Technol. Vol. 30, pp. 1-14, 2021, (IOP publishing, impact factor 3.193)

vi. Upasana P. Padhi, Awanish P. Singh, Ratan Joarder, Experimental and numerical investigations of double pulse laser energy deposition in air, International Journal of Heat and Fluid Flow, Vol. 82, April 2020, 108563 (Elsevier, impact factor 2.487).

vii. Awanish Pratap Singh, Upasana P. Padhi, Ratan Joarder, Arnab Roy, Spatio-temporal effect of the breakdown zone in the laser-initiated ignition of atomized ethyl alcohol-air mixture, Applied Energy, Vol. 247, pp. 929-940, 2019 (Elsevier, impact Factor 7.9).

Monograph

i) Mosbach, Thomas, Gebel, Gregor C., and **Joarder, Ratan**, Detailed Characterization of Fuel Nozzles for Validation of CFD codes, Monograph, 82917, LuFo IV - Projekt EffMaTec, WP 5.1.3, Institute of Combustion Technology, DLR, Stuttgart, Germany, 2013. https://elib.dlr.de/82917/