BIO-DATA

Surname:	Mahanta
First name(s):	Pinakeswar
Designation:	Director, NIT Arunachal Pradesh Professor, Mechanical Engineering Department, NIT Arunachal Pradesh Professor, Mechanical Engineering Department, IIT Guwahati(On deputation)
Academic degree:	Ph.D.
Date of birth:	01-04-1963
Gender:	Male
Marital Status :	Married
Nationality:	Indian
Institute name/place of work:	Indian Institute of Technology Guwahati
Address:	Guwahati – Assam
Postcode, city:	781039
Country:	India
E-mail:	pinak@iitg.ac.in
Phone number:	+91 0360-2284801
Fax number:	+91 0360-2284972

Education:

- Ph.D. (2001) Mechanical Engineering, Indian Institute of Technology Guwahati.
- M.Tech. (1993) Mechanical Engineering, Indian Institute of Technology Kharagpur
- B.Sc. Engineering (1985) Mechanical Engineering, Regional Engineering College Rourkela

Administrative Experience/ Post(s) & responsibilities held:

- Director, NIT Arunachal Pradesh (14-09-2018 to till date)
- Officiating Director, Director, IIIT Bhagalpur (June 2017 to Sep. 2018)
- Dean of faculty affairs, IIT Guwahati (01-09-2014to 31-08-2017)
- Head, Mechanical Engineering, IIT Guwahati (12-01-2012to 3-09-2014)
- Head, Centre for Energy, IIT Guwahati (17-4-2004 to 02-08-2011)

Academic/Teaching Experience & responsibilities

- Professor (HAG) in Mechanical Engineering, IIT Guwahati (w.e.f 01-05-2014)
- Professor in Mechanical Engineering, IIT Guwahati (10-04-2008 to 30-04-2014)
- Associate Professor in Mechanical Engineering, IIT Guwahati (14-10-2004 to 09-04-2008)
- Assistant Professor in Mechanical Engineering, IIT Guwahati (23-01- 2001 to 13-10-2004)
- Assistant Executive Engineer, Govt. of Assam (May, 1986-January, 2001)

Area of Specialization and research interest:

Heat transfer, fluidization, biogas, gasification and combustion, renewable energy.

Participation and contribution in relevant areas in higher education:

	Organization	Area of specialisation
Professor/JSPS Fellow(by invitation)	Gifu University Japan	Mechanical Engineering, co-gasification of biomass with coal.
Resource Person	Hof University of Applied Sciences, Germany	Energy Technology
Distinguished Visiting Fellow	University of Nottingham, U.K.	Clean coal and biomass gasification technology

Publication (Total Number):157 (Journal 91+ NC 12+IC 54)

Selected Publications

Sl. No **Publication Details**

[1]. Gunjo, D.G., Jena, S.R., Mahanta, P. and Robi, P.S., 2018. Melting enhancement of a latent heat storage with dispersed Cu, CuO and Al_2O_3 nanoparticles for solar thermal application. *Renewable Energy*.

[2]. Gunjo, D.G., Mahanta, P. and Robi, P.S., 2017. Exergy and energy analysis of a novel type solar collector under steady state condition: Experimental and CFD analysis. *Renewable Energy*, *114*, pp.655-669.

[3]. Sarbassov, Y., Zayoud, A., Mahanta, P., Gu S., Ranganathan P., Saha UK., 2017. Hydrodynamic experiments on a small-scale circulating fluidized bed reactor at elevated operating pressure, and under an O_2/CO_2 environment. Thermal Science, 21(2), pp.1093-1104.

[4]. Zayoud, A., Mahanta, P. and Saha, U.K., 2017. Pure oxy-fuel circulating fluidized bed combustion by controlling adiabatic flame temperature using fuel staging. *CURRENT SCIENCE*, *113*(8), p.1560.

[5]. Hauchhum, L. and Mahanta, P., 2017. Performance enhancement of CO2 capture from flue gas in a bubbling fluidized bed. *Journal of the Energy Institute*, *90*(5), pp.764-775

[6]. Mallick, D., Mahanta, P. and Moholkar, V.S., 2017. Co-gasification of coal and biomass blends: chemistry and engineering. *Fuel*, *204*, pp.106-128.

[7]. Yadav, D., Barbora, L., Bora, D., Mitra, S., Rangan, L. and Mahanta, P., 2017. An assessment of duckweed as a potential lignocellulosic feedstock for biogas production. *International Biodeterioration& Biodegradation*, *119*, pp.253-259.

[8]. Sarbassov, Y., Zayoud, A., Mahanta, P., Gu, S., Ranganathan, P. and Saha, U., 2017. Hydrodynamic experiments on a small-scale circulating fluidised bed reactor at elevated operating pressure, and under an O2/CO2 environment.

[9]. Ghatak, M.D. and Mahanta, P., 2017. Kinetic Model Development for Biogas Production from Lignocellulosic Biomass. *Mechanical Engineering*, *8*(4).

[10]. Zayoud, A., Sarbassov, Y., Mahanta, P., Saha, U.K. and Gu, S., 2017. Influence of Aeration on the Hydrodynamic Behavior of a Pressurized Circulating Fluidized Bed. In *Fluid Mechanics and Fluid Power–Contemporary Research* (pp. 105-114). Springer, New Delhi.

[11]. Yadav, D., Barbora, L., Rangan, L. and Mahanta, P., 2016. Tea waste and food waste as a potential feedstock for biogas production. *Environmental Progress & Sustainable Energy*, *35*(5), pp.1247-1253.

[12]. Shelke, G.N. and Mahanta, P., 2016. Feasibility Study on Utilization of Biomass Briquette in a Conventional Downdraft Gasifier. *International Energy Journal*, *15*(4). pp. 157-166.

[13]. Hauchhum, L. and Mahanta, P., 2016. Performance enhancement of CO 2 capture from flue gas in a bubbling fluidized bed. *Journal of the Energy Institute*.http://dx.doi.org/10.1016/j.joei.2016.06.007

[14]. Sharma, M., Mahanta, P. and Mishra, S.C., 2016. Usability of porous burner in kerosene pressure stove: An experimental investigation aided by energy and exergy analyses. *Energy*, *103*, pp.251-260.

[15]. Sharma, M., Mishra, S.C. and Mahanta, P., 2016. Effect of burner configuration and operating parameters on the performance of kerosene pressure stove with submerged porous medium combustion. *Applied Thermal Engineering*, *107*, pp.516-523.

[16]. Hauchhum, L., Mahanta, P. and De Wilde, J., 2015. Capture of CO2 from Flue Gas onto Coconut Fibre-Based Activated Carbon and Zeolites in a Fixed Bed. *Transport in Porous Media*, *110*(3), pp.503-519.

[17]. Loha, C., Gu, S., De Wilde, J., Mahanta, P. and Chatterjee, P.K., 2014. Advances in mathematical modeling of fluidized bed gasification. *Renewable and Sustainable Energy Reviews*, *40*, pp.688-715.

[18]. Raha, D., Mahanta, P. and Clarke, M.L., 2014. The implementation of decentralised biogas plants in

Assam, NE India: The impact and effectiveness of the National Biogas and Manure Management Programme. *Energy Policy*, *68*, pp.80-91.

[19]. Hauchhum, L. and Mahanta, P., 2014. Kinetic, thermodynamic and regeneration studies for CO2 adsorption onto activated carbon. *International Journal of Advanced Mechanical Engineering*, *4*, pp.27-32.

[20]. Hauchhum, L. and Mahanta, P., 2014. Carbon dioxide adsorption on zeolites and activated carbon by pressure swing adsorption in a fixed bed. *International Journal of Energy and Environmental Engineering*, *5*(4), pp.349-356.

Books/Chapters/course material Developed

Book chapters: **7**

- B Buragohain, **P Mahanta** and V S Moholkar, Thermodynamic Approach to design and optimization of Biomass Gasifier Utilizing Agro-residues, Green energy and Technology, pp.157-195.ISSN1865-3529, ISBN-978-1-4471-2305-7, DOI: 10.1007/978-1-4471-2306-4.

- P. Kalita, P**. Mahanta** and U. K. Saha, 2015, Pressurized Circulating Fluidized bed Technology: A review towards a novel design approach, in the Multi Vol. Set on "ENERGY SCIENCE AND TECHNOLOGY", volume -11, hydrogen and other Technologies, StudiumPress (USA) Pvt. Ltd., 481-526.

- R.S. Patil, **P. Mahanta**, M. Pandey, Experimental and Computational Studies on Effects of Scale-Up of Riser on Heat Transfer Chatacterisitcs of Circulating Fluidized Bed, Springer science + business Media Dordrectht 2015 DOI 10.1007/978-94-017-9804-4_19.

- B. Buragohain, **P. Mahanta** and V. S. Moholkar. First Principle Design of a Circulating Fluidized Bed (CFB) Biomass Gasifier. In: New Technologies for Rural Development Having Potential for Commercialization (Editor: J. P.Shukla), Allied Publishers Pvt. Ltd., New Delhi (2009) pp.210-223. Economies (Editor, A. Karagiannidis), springer.

- Jana, K., Mahanta, P. and De, S., 2018. Role of Biomass for Sustainable Energy Solution in India. In Sustainable Energy and Transportation (pp. 209-233). Springer, Singapore.

- Mallick, D., Buragohain, B., Mahanta, P. and Moholkar, V.S., 2018. Gasification of Mixed Biomass: Analysis Using Equilibrium, Semi-equilibrium, and Kinetic Models. In Coal and Biomass Gasification (pp. 223-241). Springer, Singapore.

- Mallick, D., Mahanta, P. and Moholkar, V.S., 2018. Synergistic Effects in Gasification of Coal/Biomass Blends: Analysis and Review. In Coal and Biomass Gasification (pp. 473-497). Springer, Singapore.

Curriculum Development Programme under QIP:

- **Course material on Advanced Engineering Thermodynamics**

http://www.iitg.ernet.in/scifac/qip/public_html/cd_cell/adv_engg_thermo_index.htm

- **Course material on Energy conservation and waste heat recovery**

http://www.iitg.ernet.in/scifac/qip/public_html/cd_cell/waste_heat_recov_index.htm

- **NPTEL web course on Advanced Engineering Thermodynamics**

http://nptel.iitm.ac.in/courses/112103016/

- **Course Material Prepared for IGNOU** Course material on Heat Power Technology
- **Course Material Prepared for IGNOU** Course material on Heat and Mass Transfer

No. of Patents awarded:**01**

Sponsored Projects (21 Nos)

S. No.	Client/Organization's	Nature of Project	Duration of project
1	Ministry of New and Renewable Energy, New Delhi	Development and performance evaluation of a 3 kWe biogas based power generation system utilizing lignocellular biomass. Conduction of trainings for NGO'S and power generation in the Auniati plant to popularized use of biogas for power generation	2 years
2	Department of Science and Technology, New Delhi	'Small-scale Anaerobic Digestion' under the "Rural Hybrid Energy-Enterprise Systems (RHEES)", Indo – UK Collaborative Research Initiative on 'Bridging the Urban and Rural Divide'	4 years
3	European Commision	IComFluid, International Collaboration on modeling of Fluidized Bed system for clean energy technologies(Marie-Curie project FP7-PEOPLE-2012-IRSES). Fast pyrolysis by blending coal with biomass for clean coal technology.	4 years
4	ESPRC,UK	Building Global Engagements for Optimizing Nutrient Recovery from wastes. Developed methodology for production of vermicompost from waste with enriched micronutrients and enhanced Phosphorous content. Process technology.	2 years
5	Ministry of New and Renewable, Energy, New Delhi	Development of Bioelectrodes for Biofuel Cell Applications.	3 years
6	Department of Biotechnology, New Delhi	Studies on structure of enzymes and their interaction with nanostructured materials for bioelectronics devices & other applications	3 years
7	Defense Research Laboratory, Tezpur	Design and Development of Digester for Utilization of Lignocellulosic Waste for Biogas Production	4 years
8	Defense Research Laboratory, Tezpur	Design and Development of Compact Cistern System for Blackwater Utilization	18Months
9	Central Power Research Institute, Bangalore	Design of a 25 KW Electrical Pressurized Circulating Fluidized Bed Unit	3 years
10	AdnENERGY, U.K	Development and Analysis of Twisted Two-bladed, Two-stage Savonius Rotor for 500 W Power Generation	2 years
11	Council of Scientific & Industrial Research, New Delhi	Development of polymer electrolyte membrane fuel cell using indigenously prepared low cost composite bipolar plate	3 years
12	Assam Science	Process development for fluoride removal from	3 years

	Technology & Environment Council (ASTEC),Assam	drinking water utilizing solar energy	
13	Ministry of New and Renewable Energy, New Delhi	Synthesis of green transportation fuels (biomass gasification integrated Fischertropsch)	2 years
14	Ministry of New and Renewable Energy, New Delhi	Design, development and commercialization of a circulating fluidized bed biomass gasifier	3 years
15	Ministry of New and Renewable Energy, New Delhi	Biogas Development and Training Centre	2006-onwards
16	Ministry of New and Renewable Energy, New Delhi	Design and development of a high performance biogas digester for north eastern region of India	3 years
17	KVIC, Mumbai,	Setting up of a technical backup unit (TBU) at IIT Guwahati for R&D interface with KVIC sector	3 years
18	ISRO, Ahmedabad	Earth radiation budget. Radioactive heat transfer analysis. The outcome was shred with ISRO for meteorological purpose.	3 years
19	Petroleum Conservation and Research Association	Development of a multi-fuel cooking stove.	2 years
20	AERB, Mumbai	Development of model to calculate radiative heat transfer in fuel channel of PHWRS	2 years
21	Department of Science and Technology	Modelling and Computation of three dimensional turbulent convective heat transfer for design of energy efficient pin heat exchanger	2 years

10. Consulting experience:

Key consulting assignments undertaken:

S. No.	Client/ Organization's	Nature of assignment	Duration of assignment
1	PVT Power, Switzerland	Design of a solar photovoltaic cum cooling system for thermodynamic management Technology was transferred to PVT Power, Switzerland	4 months
2	Oil India Limited, Duliajan, Assam	Project preparation on Generation Of Electrical Power From Small Quantities Of Gas Available In Isolated Pockets Of OIL India's Oil Fields	6 months
3	Department of Agriculture Government of Assam	Performance testing of 5hp diesel engine driven centrifugal pump sets	6 months

Other Activities:

- Conducted a one week course on Electricity systems and future scenario along with Prof Richard E. Blanchard, Loughborough University, UK under Global Initiative of Academic Networks(GIAN) organised by IIT Guwahati, 6-11 November, 2016.
- Conducted a one week course on Advances in Combustion and Gasification Technology along with Prof. Yoshinori Itaya, Gifu University, Japan, and Dr. P. Kalita, IIT Guwahati under Global Initiative of Academic Networks (GIAN) organised by IIT Guwahati, 29th Oct-2nd November, 2018.

Short term training programs conducted (07 Numbers)

Keynote lectures, seminars attended

a. Participated in India-**UK Innovation Forum**, 8-10th September, 2010 at London, UK.
b. Chaired a session **in IAENG conference Mechanical Engineering**, July 2, 2010, Imperial College London, UK. Attended and presented one paper in the same conference.
c. Participated in **UK-India Sustainable Energy Technology Network, Nottingham, UK, 8-10 September, 2009.**
d. Attended **2nd Indo-Us Frontiers of Engineering symposium**, Irvine, California, 27Feb-1 March, 2008
e. Attended **7th ISHMT - ASME Heat Transfer Conference and 18th National Heat and Mass Transfer Conference**, Guwhati, India, January 2006.
f. Attended and coorganized**22nd National convention of Mechanical Engineers' on "Energy Technologies-Strategies for Optimal Utilization of Natural Resources",** The Institution of Engineers' (India), Guwahati, 9-10 September, 2006.
g. Attended workshop on **Modelling and quality control for advanced and innovative fuel technologies**, 14-25 November, 2005, ICTP, Trieste, Italy (In collaboration with IAEA Vienna, Austria).
h. Attended workshop on **Role of partitioning and transmutation in the mitigation of the potential environmental impacts of nuclear fuel cycle**, 20-24 November, 2006, ICTP, Trieste, Italy (In collaboration with IAEA Vienna, Austria)
i. Attended workshop on **Energy Technology R&D in India and the United States: Opportunities for cooperation**, New Delhi, 19-21 August, 2004.
j. Attended and presented a paper in 7th **Triennial International Symposium on Fluid Control, Measurement and Visualization**, Sorrento, Italy, August 25-28, 2003
k. Attended **18th National Convection of Mechanical Engineers & National Seminar on "Emerging Trends in Mechatronics for Automation**", November 9-10, 2002, at NIT, Rourkela. Attended **2nd Indo-Us Frontiers of Engineering symposium**, Irvine, California, 27Feb-1 March, 2008
l. Attended **2nd Indo-Us Frontiers of Engineering symposium**, Irvine, California, 27Feb-1 March, 2008

1. Mentor of young woman scientist project funded by DST
2. **M. TECH projects guided:** Completed – 15 Nos
3. **B. Tech Projects guided:** Completed- 24 Nos
4. **Mentored PDF**-01 No
5. **Supervision of PhD Students:** completed 15 Nos.

P. Mahanta