

# CURRICULUM VITAE

**AMULYA BIHARI PATTNAIK**

**B-Tech, M-Tech, PhD (Continuing) IIT, Bombay**

Assistant Professor

Metallurgical and Materials Engineering Department

Indira Gandhi Institute of Technology, Sarang

(An autonomous institute of Govt. of Odisha)

Contact No: +917381972239

E-mail: [amulyapattnaik@igitsarang.ac.in](mailto:amulyapattnaik@igitsarang.ac.in)



## Research Interests

- Corrosion of low alloy steels at ambient and laboratory-based environments with primary focus on passive film characterization.
- Mechanical behavior of materials at ambient, high and low temperature under slow and nominal strain rate.
- Effect of material chemistry microstructure, cold work, temperature, prior deformation etc. on the mechanical behavior of metals and alloys.
- Creep behavior of metals and alloys.
- Physical Metallurgy: Structure-Property relationship of metals and alloys, characterization of degraded microstructure using SEM, XRD, TEM, EPMA etc.
- Acoustic Emission signal analysis to study the deformation behavior.

## Educational Qualifications:

| <i>Degree</i>   | <i>Board</i>         | <i>Institution/University</i>  | <i>CGPA/<br/>Percentage</i>                        | <i>Year</i>       |
|---|----------------------|--|--|-------------------|
| PhD<br>(Corrosion Science<br>and Engineering)           | IIT, Bombay          | Indian Institute of Technology<br>Bombay                               | 8.45   | <i>Continuing</i> |
| M-TECH<br>(Material Resource<br>Engineering)            | AcSIR, New<br>Delhi  | CSIR-Institute of Minerals and<br>Materials Technology,<br>Bhubaneswar | 8.49<br>( <i>Honors<br/>with<br/>Distinction</i> ) | 2012              |
| B-TECH<br>(Metallurgical &<br>Materials<br>Engineering) | B.P.U.T,<br>Rourkela | Indira Gandhi Institute of<br>Technology, Sarang(govt.)                | 8.71<br><i>Branch<br/>Topper</i>                   | 2010              |
| 12th  | C.B.S.E              | D.A.V Public School, Cuttack   | 79   | 2005              |
| 10th  | C.B.S.E              | D.A.V Public School, Cuttack   | 64.8   | 2003              |

## Work Experience

| <i>Designation</i>  | <i>Institute/Organization</i>  | <i>Duration</i>           |
|---------------------|--|---------------------------|
| Assistant Professor | Indira Gandhi Institute of Technology (IGIT), Sarang, Odisha                             | Aug, 2014 to till date    |
| Scientist           | CSIR-Advanced Materials and Processes Research Institute, Bhopal (AMPRI), Madhya Pradesh | March, 2013 to July, 2014 |
| Scientist Trainee   | CSIR-Institute of Minerals and Materials Technology (IMMT), Bhubaneswar, Odisha          | Aug, 2010 to March, 2013  |

## Equipments Handled (Hands on experience and expertise)

**Metallurgical Microscope** with image analysis, **X-Ray Diffractometer(XRD)**, **Acoustic Emission System (PCI-DiSP)** 4channel, **Ultrasonic Flaw Detector** with phased array technology, Universal Testing Machine (both servo hydraulic and screw driven), Air jet erosion tester, Dynamic Elastic property Analyzer(DEPA), High strain rate Impact tester, Universal Hardness Tester, FESEM, SEM etc.

## Publications

- ✓ A.B. Pattnaik & B.B. Jha, “**Effect of Microstructural Degradation on Acoustic Emission during tensile deformation of 2.25Cr-1Mo steels**”, *Canadian Metallurgical Quarterly, Maney Publishing house, Vol 52, No.2, 2013, pp. 217-221*
- ✓ A.B. Pattnaik, B.B. Jha and R. Sahoo, “**Effect of strain rate on acoustic emission during tensile deformation of  $\alpha$ -brass**”, *Material Science and Technology, Maney Publishing, Vol 29, No. 3. 294-299, 2013*
- ✓ A.B. Pattnaik, “**Erosive wear analysis of normalised and thermally aged 2.25Cr-1Mo steel using Taguchi experimental design**”, *Indian Journal of Engineering and Material Sciences, Vol.21, August 2014.*
- ✓ A.B. Pattnaik, S. Das, B.B. Jha and Prasanth N., “**Effect of Al-Ti-B grain refiner on microstructure, mechanical properties and acoustic emission characteristics of Al5052 aluminium alloy**”, *Journal of Material Research Technology, Elsevier, 2015.*
- ✓ AB Pattnaik, S Das, BB Jha, **Effect of Forging on Microstructure, Mechanical Properties and Acoustic Emission Characteristics of Al Alloy (2014): 10 wt.% SiC p Composite**, *Journal of Materials Engineering and Performance, 1-9, 2019.*

- ✓ AB Pattnaik, B Dash, U Nanda, SC Patnaik, **Optimization of dry sliding wear behaviour of AA6061 (as cast) and AA6061 (HT) aluminium alloy using design of experiment approach**, *Journal of Material & Metallurgical Engineering* 9 (2), 1-6, 2019.
- ✓ Pattnaik, A.B., Das, S. **Probability of Formation of Wear Debris during Initial Running-In Period of Sliding Wear of Al-Si (LM13)-10 wt.% Fly Ash Composites**. *J. of Materi Eng and Perform* 29, 7480–7487 (2020). <https://doi.org/10.1007/s11665-020-05211-z>.

### **Conferences (International/ National)**

- ✓ Paper presented on “**Acoustic Emission during tensile deformation of 2.25Cr-1Mo steel**”, by A.B. Pattnaik & B.B. Jha in the **3<sup>rd</sup> Asian Symposium on Materials and Processing at IIT Madras**, jointly organised by. Paper accepted for publication as conference proceeding.
- ✓ Paper presented on “**Effect of microstructural degradation on acoustic emission during plastic tensile deformation of 2.25Cr-1Mo steel**”, by A.B. Pattnaik & B.B. Jha in the **3<sup>rd</sup> International Conference on Thermo-Mechanical Simulation and Processing of Steel (SIMPRO 2012)**, RDCIS, SAIL, Ranchi.
- ✓ Paper presented on “**Effect of strain rate on Acoustic emission during tensile deformation of  $\alpha$ -brass**”, by A.B. Pattnaik & B.B. Jha in the **National Conference on processing and characterization of Materials**, NIT, Rourkela, 2012.
- ✓ Paper presented on “**Effect of Al-5Ti-1B grain refiner on microstructure and mechanical properties of Al5052 aluminium alloy**” by A.B. Pattnaik & S. Das in the **International Conference on Emerging Materials and Processes at CSIR-IMMT Bhubaneswar, 2014**.
- ✓ SK Sahoo, J Majhi, AB Pattnaik, JK Sahoo, S Das, **Mechanical properties enhancement and microstructure study of Al-Si-TiB<sub>2</sub> in situ composites**, *IOP Conference Series: Materials Science and Engineering* 338 (1), 012060, 2019.
- ✓ SR Rana, AB Pattnaik, SC Patnaik, **Comparison of wear behavior and mechanical properties of as-cast Al6082 and Al6082-T6 using statistical analysis**, *IOP Conference Series: Materials Science and Engineering* 338 (1), 012050, 2019.
- ✓ Pany J, Barik RK, Sahoo SK, Patnaik SC, Majhi J, Pattnaik AB. **Mathematical modeling for the prediction of wear rate of Al-12.6 Si/TiB<sub>2</sub> in situ composites**. *Materials today: proceedings*. 2020 Jan 1; 33:5530-3.

### **Awards & Recognition**

- ✓ **QIP Fellowship** from AICTE to pursue PhD at IIT, Bombay.
- ✓ Recipient of **POSCO ASIA FELLOWSHIP** in the year 2007, provided by the **POSCO TJ Park Foundation, South Korea** for securing highest marks in the university examination.
- ✓ Recipient of **CSIR Quick Hire Fellowship** from CSIR in August 2010.

- ✓ Qualified **GATE** three times in a row (2010, 2011, and 2012) in Metallurgical Engineering.
- ✓ Reviewer of **Canadian Metallurgical Quarterly**, Maney Publishing.
- ✓ Life Member of **Indian Institute of Metals (IIM)**.

## EQUIPMENTS HANDLED

- ✓ **LEICA 3000M** Metallurgical Microscope with image analysis.
- ✓ **Tinius Olsen** makes 50Kn Material Testing Machine.
- ✓ **Instron** Impact testing machine
- ✓ **Acoustic Emission System (PCI-DiSP)** 4channel.
- ✓ **Ultrasonic Flaw Detector** with phased array technology.
- ✓ **Ducom** Air Jet Erosion Tester.
- ✓ **Bruker** X-Ray Diffractometer.
- ✓ **Lensis** Thermal Mechanical Analyzer
- ✓ **VIBXPRT** Noise and vibration analyser
- ✓ **Nova Nano** SEM with EBSD.

## Teaching assignments (at IGIT, Sarang)

| Type of Course | SI No | Course Code | Title of course                           | Level | During   |
|----------------|-------|-------------|---|-------|--|
| Theory         | 1     | PMT6J004    | Nonferrous extractive metallurgy          | UG    | Autumn 2014-15                                 |
|                | 2     | PMT7J001    | Materials for Advanced Applications       | UG    | Spring 2015-16, Spring 2016-17                 |
|                | 3     | PMT4I104    | Deformation Behavior of Materials         | UG    | Spring 2016-17, Autumn 2017-18, Autumn 2018-19 |
|                | 4     | PMT3I102    | Metallurgical Thermodynamics and Kinetics | UG    | Autumn 2017-18                                 |
|                | 5     | PC 2        | Mechanical Behavior of Materials          | PG    | Spring 2017-18                                 |
|                | 6     | PC 1        | Transport Phenomena in Metallurgy         | PG    | Spring 2018-19                                 |
| Laboratory     | 1     |             | Deformation Behavior of Materials Lab     | UG    | Spring 2016-17, Autumn 2017-18, Autumn 2018    |

|  |   |  |  |    |                |
|--|---|--|--|----|----------------|
|  | 2 |  | Metallurgical Thermodynamics and Kinetics Lab  | UG | Autumn 2017-18 |
|  | 3 |  | Material Processing and Process Metallurgy Lab | PG | Spring 2017-18 |

## Administrative assignments (at IGIT, Sarang)

### *Institute*

- Member of the Institute purchase committee (July 2018 to July 2019)
- Deputy Center Superintendent, University exams (July 2016 to July 2019)
- Deputy Center Superintendent, Faculty recruitment Exam.

### *Department*

- Member of the Department purchase committee (July 2018 to July 2019)
- Professor in charge Department library
- Laboratory In charge, Material Testing Lab
- Laboratory In charge, Material Processing Lab
- Member Department Board of studies
- Faculty In charge Academic monitoring committee
- Convenor Departmental faculty meeting
- Faculty advisor to Under graduate students of the department
- Representative to Central Library from Metallurgical and Materials Engineering Department.
- Convenor, ADMANTIUM 3.0 a techno cultural event of the department

## References

- ✓ **Prof. B.K. Mishra, Director**  
Indian Institute of Technology, Goa  
Email: [bk@iitgoa.ac.in](mailto:bk@iitgoa.ac.in) , [director@iitgoa.ac.in](mailto:director@iitgoa.ac.in)  
Phone no: +91-9437575157  
Tel: +91-674-2581126, Fax: +91-674-2581160
- ✓ **Dr. B.B. Jha, Ex Chief Scientist & Head**  
CSIR- Central Glass and Ceramic Research Institute (CGCRI), Kolkata  
Email: [bbjha@immt.res.in](mailto:bbjha@immt.res.in)  
Phone no: +91-9861013526
- ✓ **Dr. S. Das, Ex-Director**  
CSIR- Advanced Materials and Processes Research Institute  
Email: [sdas88@hotmail.com](mailto:sdas88@hotmail.com)  
Phone No: +91-9425303176
- ✓ **Prof. Smrutiranjana Parida, Professor**  
Metallurgical and Material Science Engineering Department  
Indian Institute of Technology, Bombay  
Email: [paridasm@iitb.ac.in](mailto:paridasm@iitb.ac.in)