Résumé

Dr. Bhanu Pant

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- **Experience Summary:**
  - Vikram Sarabhai Space Centre, ISRO from 1982 to 2021 (superannuated as Outstanding Scientist/ Group Director)
  - College of Engineering Pune (CoEP) as Professor of Practice from August 2021 to June 2022
  - Full time Advisor at Kalyani Centre for Technology & Innovation; Bharat Forge, Pune from June 202 to June 2023.
  - Centre for Space Science and Technology, IIT, Roorkee from September 2023

Qualifications/ affiliations

- BE (Met) 1982 University of Roorkee,
- M Tech (Met) IT, Kanpur, (External registration)
- PhD (Met) IIT Roorkee. (External registration);
- Fellow IIM, LM- AeSI, ISSE.

Experience

@VSSC/ ISRO-

- ✓ Joined ISRO in November 1982 through Campus interview from erstwhile University of Roorkee.
- ✓ Part of multidisciplinary Space Generation Task Group in 1999 formed by Chairman ISRO to generate the roadmap of ISRO. Members were from all the Centres of ISRO and worked closely to generate the roadmap which over the years has seen execution of most of the projects as planned.
- ✓ Worked extensively on development of special materials and systems for Indian Space Program launch vehicle and satellite applications.
- ✓ Led a unique Group handling research and development activities encompassing metallic/ ceramic/ ceramic-composite materials; process developments and characterization for ISRO programs. Professionals with varying expertise in materials, metallurgy, mechanical, chemical and physics work in the ten Divisions of this Group.

- ✓ Chaired the committees responsible for review and assessment of new and ongoing Technology Development Programmes in Materials and Manufacturing and Additive Manufacturing at VSSC.
- ✓ Worked in the area of Gamma Titanium Aluminides, prospective lightweight high temperature material for space applications. Awarded PhD from IIT Roorkee for thesis in this area of work. Worked for master's at IIT Kanpur on Iron Aluminides.
- ✓ Significant contributions in processing of titanium alloy components and also in critical components of dissimilar-metal and same-metal joints. The team led by me developed components successfully with virtually no benchmark available in the field for space applications.
- ✓ Indigenous processing and electron beam welding technology of various titanium alloys for application as room temperature/ cryogenic high-pressure gas bottles and propellant tanks. Few highlights-
    - First time indigenously developed difficult-to-forge Ti5Al2.5Sn-ELI alloy for cryogenic gas bottles for GSLV-Mk3 program which has given payload advantage of nearly 100kg. This leads to immense revenue saving in every launch (Payload launch cost ~$20000/kg) and also allows for extra number of transponders in the satellite.
    - Unique low-cost hot-pressing route is successfully developed which has significance for India in view of available limited press-capacity while producing Near-Net-Shape semis for ISRO.
- ✓ Worked for setting-up of the 500 Ton Titanium Sponge plant at KMML, Chavara jointly with DMRL.
- ✓ Collaborated effectively with various industries for indigenous production of qualified special alloy components required for Indian Space Program.
- ✓ Special functional materials-
    - Major lead taken in indigenization of electronic and magnetic materials which is very critical for miniaturization of spacecraft and launch vehicle devices.
    - Taken up the indigenous development of Optical Glasses and Glass Ceramics for spacecraft applications through MoUs with CGCRI, Kolkata and ARCI, Hyderabad respectively. Presently, there is single point import dependence for these critical parts.
    - Successfully developed thermionic emitters through MoU with CEERI, Pilani for electric propulsion system.

@CoEP as Professor of Practice -

- Worked towards applied research by interactions at CoEP with research Institutes like ISRO and DRDO.
- Guided two M Tech students for 7 months project thesis work at VSSC/ ISRO Trivandrum. Guided BTech Project on Titanium alloy Additive manufacturing and property evaluation at cryogenic temperature.
- Completed course on Forging Technology for final year BTech students.

@KCTI as Advisor-

- **Worked closely with dedicated team at KCTI, Bharat Forge towards development of sustainable technologies for Automotive and environment protection-**
    - Working on Green Hydrogen Project. Presently installation of two types of electrolysers with 8kg/ day of Green Hydrogen is completed.
    - Interacted with Fraunhoffer, Germany; DMRL, Hyderabad and ARCI, Chennai to work out a joint development program in the area of Lean Rare Earth Magnets
    - Interacted with visited various IITs (Tirupati, Jodhpur, Bombay, Guwahati) for new technologies up-scaling possibilities.
    - Visited South Korea to Represent Bharat Forge in the Science, Technology and Copy rights Mission to South Korea (3-7 April 2023) from Confederation of Indian Industries (CII) on Science, Technology and Intellectual Property
    - Interacted with South Korean companies for PEM Electrolyser and fuel cell development. Further possibility for joint collaborative work is under discussion.
- Joint Guidance for Research:
    - 2 Students M Tech (IIT, Madras)
    - Guided MTech student at DIAT, Pune sponsored from Bharat Forge Ltd & 2 at ISRO from CoEP
    - 3 PhD External Scholars (Completed 2 at IIT-Roorkee & Madras and 1 at CUSAT, Kochi)
- Papers/ Patents (with various teams):

✓ Papers published: 127, Book Chapter: 1
✓ Indian Patent: Granted-3 (Patent Nos.:305174, 316444, 389599)

Major Awards & Recognitions

- Member of the **National Council, Indian Institute of Metals**, 2020-21.
- Conferred ***Fellow*** *of Indian Institute of Metals* during 55th National Metallurgists Day & 71st Annual Technical Meeting (NMD-ATM 2017) at BITS, Goa 11-14 Nov 2017.
- **ISRO Team Excellence Awards** for years 2012 and 2015
- **Metallurgist of the Year Award– 2011 from Ministry of Steel, Government of India**, November 2011 at Hyderabad.
- **SAME Anweshak Award– 2007**, Society for Aerospace Manufacturing Engineers, Trivandrum, December 2007.
- **ISAMPE 2000 Outstanding Design/ Process Development Award**, July 2000, Bangalore.
- **Member in National Committees-**
    - Expert Committees for appraisal/ recommendation of new & ongoing **CSIR** proposals on NCP (Niche Creating High Science/ High Technology Projects) and FBR (Focused Basic Research) Projects under 'Mining, Minerals, Metals and Materials (4M)' theme.

- Member in the Monitoring Committee- CSIR- Fundamental & Innovative Research in Science of Tomorrow (CSIR- FIRST)
- Member of Aerospace Resources Panel of Aeronautics Research and Development Board (AR&DB of DRDO) to review new and ongoing Research funding proposals from various Institutes across India.
