भारत सरकार /Government of India
परमाणु ऊर्जा विभाग / Department of Atomic Energy
**होमी भाभा राष्ट्रीय संस्थान / Homi Bhabha National Institute**
राजा रामन्ना प्रगत प्रौद्योगिकी केन्द्र
**Raja Ramanna Centre for Advanced Technology**

# HBNI Faculty Profile

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| **Name** | *Dr. Ramakanta Biswal* |  |
| **Designation** | *Associate Professor* | |
| **Research Area** | *Lasers, Laser materials processing, Optical fiber gratings, Optical fiber sensors, Optics* | |
| **Research Profile** | Developed successfully different state-of-art laser systems and utilised them in different materials processing applications. These include development of high power, high beam-quality advanced copper lasers (CVL), dye lasers & their nonlinear frequency-converted UV sources for their applications in spectroscopy & materials processing; development of high energy Q-switched Nd:YAG laser oscillator-amplifier system and its deployment for laser shock peening studies of different materials; development of several other exotic & complex laser systems i.e. diode-pumped alkali laser and diode-pumped thin-disk laser. Utilised some of the above developed lasers for laser micromachining studies. Currently working on inscription of optical fiber gratings using CVL-UV, $CO_2$ & femtosecond lasers; development of high performance optical fiber sensors for radiation, temperature, strain, chemicals etc. | |

**Ten Selected Recent Publications**

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| **1.** | **R. Biswal**, O. Prakash, S. K. Dixit; **2022**<br>Studies on high power second-harmonic deep-UV generation from a high repetition-rate Cu-HBr laser<br>*Laser Physics* 32(12), 125002 |
| **2.** | T. Bhardwaj, M. Shukla , A. K. Rai , **R. Biswal**, K. Ranganathan , P. Ganesh, K. S. Bindra, R. Kaul; **2021**<br>Experimental investigation of multiple laser shock peening on mechanical properties of laser sintering additively manufactured maraging steel<br>*Journal of Materials Engineering and Performance* 30, 8515-8528 |
| **3.** | R. Sundar, C. Sudha, A. K. Rai, P. Ganesh, Ashish Kolhatkar, S. Murugesan, V. Karthik, **R. Biswal**, S. Raju, K. Ranganathan, R. Kaul, K. S. Bindra; **2020** |

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| | Effect of laser shock peening on the microstructure, tensile and heat transport properties of Alloy D9<br>*Lasers in Manufacturing and Materials Processing* 7, 1-9 |
| **4.** | **R. Biswal**, G. K. Mishra, S. K. Agrawal, S. K. Dixit, S. V. Nakhe; **2019**<br>Studies on design and parametric effects of a diode pump alkali (rubidium) laser<br>*Pramana- Journal of Physics* 93(4):58, 1-9 |
| **5.** | A.K. Rai, **R. Biswal**, R.K. Gupta, S.K. Rai, R. Singh, U. K. Goutam, K. Ranganathan, P. Ganesh, R. Kaul, K.S. Bindra; **2019**<br>Enhancement of Oxidation Resistance of Modified P91 Grade Ferritic-Martensitic Steel by Surface Modification using Laser Shock Peening<br>*Applied Surface Science* 495:143611,1-12 |
| **6.** | A.K. Rai, **R. Biswal**, R.K. Gupta, R. Singh, S.K. Rai, K. Ranganathan, P. Ganesh, R. Kaul, K.S. Bindra; **2019**<br>Study on the effect of multiple laser shock peening on residual stress and microstructural changes in modified 9Cr-1Mo (P91) steel<br>*Surface and Coatings Technology* 358, 125-135 |
| **7.** | G.K. Mishra, A. Kumar, O. Prakash, **R. Biswal**, S. K. Dixit, S. V. Nakhe; **2016**<br>Linewidth of a high pulse repetition rate (~20 kHz) class dye laser<br>*Laser Physics* 26 (1), 015003, 1-8 |
| **8.** | **R. Biswal**, P. K. Agrawal, S. K. Dixit, S. V. Nakhe; **2015**<br>Studies on the generation of 1.5 W average power, 18 kHz repetition rate coherent mid-ultraviolet radiation at 271.2 nm<br>*Applied Optics* 54 (32), 9613-9621 |
| **9.** | G. K. Mishra A. Kumar, O. Prakash, **R. Biswal**, S. K. Dixit, S. V. Nakhe; **2015**<br>Flow and thermal characteristics of high Reynolds number (2800-17000) dye cell: simulation and experiment<br>*Applied Optics* 54(11), 3106-3114 |
| **10.** | **R. Biswal**, P. K. Agrawal, O. Prakash, G. K. Mishra, S. K. Dixit, S. V. Nakhe; **2014**<br>Studies on the spatial, spectral and energy characteristics of Copper – Hydrogen Bromide laser radiations<br>*IEEE Journal of Quantum Electronics 50(2)*, 112-119 |