Brief Biodata

Name: Dr. Komal Bapna

Designation:	**Scientist**	
DP No. and Name:	**D 1.03 Temperature and Humidity Metrology**	
DU No. and Name:	**D 1.0 Physico-Mechanical Metrology**	
Email:	**komal.bapna@nplindia.org**	
Date of Joining CSIR-NPL:	**16th Feb. 2018**	
Phone *(office)*	**011-45609231/47091693**	
Mobile *(optional)*	**-**	

Research Area/ Interest

Temperature and humidity metrology, Temperature and Humidity Standards : R&D and Calibrations in the area of Thermometry, Thermocouples and Pyrometry, Metal-Carbon Eutectics, Thermal Imagers, Humidity sensors, Infrared Detectors, Boltzmann constant based new kelvin, Resonant photoemission, X-ray photoemission, Thin films, Perovskite based Colossal Magneto-resistance materials, Diluted magnetic semiconductors, Hybrid structures, Band structure calculations

Educational Qualifications

(Please write latest qualification first)

Degree	**Subject**	**University/ Institute**	**Year**
Ph.D.	Physics : Thesis entitled, *"Tailoring Structural, electronic and Magneto-Transport Properties of Functional Magnetic Oxides Thin Films"*	UGC-DAE Consortium for Scientific Research, Indore	2013
M.Phil.	Physics	Devi Ahilya VishvaVidyalaya, Indore	2009
M.Sc.	Physics	Banasthali University, Banasthali	2008
B.Sc. Honours	Physics, Maths	Rajasthan University, Jaipur	2006

Academic / Research Experience

Grade / Post	Institute	Duration		Research Field
		From	To	
Scientist	CSIR-NPL, New Delhi	2018	Till date	R&D in Temperature and Humidity Metrology. Primary ITS-90 thermometry, radiation Pyrometry, Humidity sensors, Infrared Detectors
DST-Inspire Faculty	M.L.Sukhadia University, Udaipur (Raj)	2015	2 years 5 months	R&D in Material Science (Experimental and theoretical), Teaching physics at UG and PG level
Research Associate	M.L.Sukhadia University, Udaipur (Raj)	2015	8 Months	R&D in Material Science (Experimental and theoretical)
Visiting Fellow	DCMP&MS, TIFR, Colaba, Mumbai	2013	1 Year	Material Science, Photoemission spectroscopy
Project Assistant	UGC-DAE CSR, Indore	2011	2.5 years	Pulsed Laser deposition, Low and High Temperature measurements at Indus-I beamline, Magnetism, Growth of hetero-structures
Project Fellow	UGC-DAE CSR, Indore	2008	2.5 years	Pulsed Laser deposition, Photoemission spectroscopy, Magnetism, Growth of epitaxial DMS/ Manganite thin films

No. of Publications

No. of Publications in SCI Journals	No. of Publications in non-SCI Journals	No. of Publications in Conference Proceedings	Books	Total
26	15	24	4 Chapters	69

Selected Publications

Sl. No	Authors	Title of the Article	Name of the journal, volume, year and page
1	U Pant, G Gupta, H Meena, A Bhatt, **K Bapn**a, DD Shivagan	Realization of ITS-90 Radiance Temperature Scale from 961.78 degrees C to 3000 degrees C at CSIR-NPL	MAPAN-JMSI (2021) https://doi.org/10.1007/s12647-021-00507-4
2	Babita, U Pant, H Meena, G Gupta, **K Bapna**, DD Shivagan	Improved Realization of Ensemble of Triple Point of Water Cells at CSIR-NPL	MAPAN- JMSI 36 (3), (2021) 615-628
3	SS Acharya, VRR Medicherla, **K Bapna**, K Ali, D Biswas, R Rawat, K Maiti	Mixed ground state in Fe-Ni Invar alloys	Journal of Alloys and Compounds 863 (2021) 158605.
4	Umesh Pant, Hansraj Meena, Gaurav Gupta, **Komal Bapna** and D.D. Shivagan	Development and Realization of FeC and Co-C Eutectic fixed point blackbodies for radiation thermometry at CSIR-NPL	Int. Journal of Thermophysics 41 (2020) 101 (1-15)
5	SS Acharya, **K Bapna**, K Ali, D Biswas, R Rawat, VRR Medicherla, K Maiti	Exchange correlation and magnetism in bcc $Fe_{0.8}Ni_{0.2}$ alloy	Journal of Electron Spectroscopy and Related Phenomena 240 (2020) 146933.
6	K Panwar, S Tiwari, **K Bapna**, K Kumar, NL Heda, DM Phase, BL Ahuja	Structural, magnetic and electronic properties of nickel ferrites: Experiment and LCAO calculations	Journal of Alloys and Compounds 831 (2020) 154835.
7	**Komal Bapna**, R.J. Choudhary, D.M. Phase, R. Rawat, B.L. Ahuja	Study of electrical and magnetic properties of RE doped layered cobaltite thin films	J. Magn. Magn. Mater. 453 (2018) 62-66
8	**Komal Bapna**, B. L. Ahuja	Electronic and Magnetic Properties of Highly Correlated Half Metallic Layered Sr_2CoO_4 Cobaltate Using mBJ Exchange Potential	J. Supercond. Nov. Magn. 30 (2017) 2901
9	S. Majumder, P. Basera, M. Tripathi, R. J. Choudhary, S. Bhattacharya, **K. Bapna** and D. M. Phase	Elucidating the origin of magnetic ordering in ferroelectric $BaTiO_{3-d}$ thin film via electronic structure modification.	J. Phys.: Condens. Matter 31 (2019) 205001
10	B. L. Ahuja, Arvind Sharma, H. S. Mund, **Komal Bapna**, Kishor	Magnetic response of Nd-doped nickel ferrites using magnetic Compton scattering and XPS measurements	Europhysics Letters 124 (2018) 17001

	Kumar, R. J. Choudhary, D. M. Phase, N. Tsuji and Y. Sakurai		
11	**Komal Bapna,** R.J. Choudhary, D.M. Phase, R. Rawat, B.L. Ahuja	Study of electrical and magnetic properties of RE doped layered cobaltite thin films	J. Magn. Magn. Mater. 453 (2018) 62
12	**Komal Bapna,** B. L. Ahuja	Electronic and Magnetic Properties of Highly Correlated Half Metallic Layered Sr_2CoO_4 Cobaltate Using mBJ Exchange Potential	J. Supercond. Nov. Magn. 30 (2017) 2901
13	S.S. Acharya, V.R.R. Medicherla, R. Rawat, **K. Bapna**, K. Ali, D. Biswas and K. Maiti	Temperature dependence of $L_3M_{45}M_{45}$ Auger transition in $Fe_{1-x}Ni_x$ Alloys	J. Electron. Spectrosc. Relat. Phenom. 1 (2016) 212
14	Arvind Sharma, H. S. Mund, **Komal Bapna**, Shailja Tiwari, M. Itou, Y. Sakurai, and B. L. Ahuja	Investigation of spin moment in Ga-substituted cobalt ferrite: magnetic Compton scattering and photoemission studies	J. Mater. Sci. 52 (2017) 4568
15	Kalpana Panwar, Shailja Tiwari, **Komal Bapna**, N. L. Heda, R. J. Choudhary, D. M. Phase, B. L. Ahuja	The effect of Cr substitution on the structural, electronic and magnetic properties of pulsed laser deposited $NiFe_2O_4$ thin films	J. Magn. Magn. Mater. 421 (2017) 25
16	Samir Bhatt, Kishor Kumar, Gunjan Arora, **Komal Bapna**, B. L. Ahuja	High energy Compton spectroscopy and electronic structure of Laves phase $ZrFe_2$	Radiat. Phys. Chem. 125 (2016) 109
17	R.R.Mohanta, V.R.Medicera, K. Mohanta, **Komal Bapna**, D. M. Phase, V. G. Sathe	Ion beam induced Chemical and Morphological changes in TiO_2 films deposited on Si(111) surface by Pulsed Laser Deposition	Appl. Surf. Sci. 325 (2015) 185
18	Megha, Vagadia, Ashish Ravalia, Savan Katba, P.S. Solanki, **Komal Bapna**, Manish Kumar, R.J. Choudhary, D.M. Phase, D.G. Kuberkar	Co-substitution driven electronic structure modifications in $Zn_{1-x}Co_xO$	J. Alloy. Compd. 610 (2014) 113
19	R. J. Choudhary, **Komal Bapna,** and D. M. Phase	Band offset measurements and magneto-transport properties of epitaxial TiO_{2-x} (x= 0.05)/$La_{0.7}Sr_{0.3}MnO_3$ heterostructure.	Appl. Phys. Lett. 102 (2013) 142408
20	**Komal Bapna**, R. J. Choudhary, and	Resonant photoemission study of epitaxial $La_{0.7}Sr_{0.3}MnO_3$ thin film	Appl. Phys. Lett. 101 (2012) 242402

	D.M. Phase	across Curie temperature.	
21	**Komal Bapna**, R. J. Choudhary, S. K. Pandey, and D. M. Phase	Implication of local moment at Ti and Fe sites for the electrical and magneto-transport properties of degenerate semiconducting $Ti_{1-x}Fe_xO_{2-d}$ epitaxial films.	J. Phys.: Condens. Matter. 24 (2012) 056004
22	**Komal Bapna,** R.J. Choudhary, D.M. Phase	Evolution of different structural phases of TiO_2 films with oxygen partial pressure and Fe doping and their electrical properties.	Materials Research Bulletin 47 (2012) 2001
23	**Komal Bapna**, R. J. Choudhary, S. K. Pandey, D. M. Phase, S. K. Sharma, and M. Knobel	Electronic depiction of magnetic origin in undoped and Fe doped TiO_{2-d} epitaxial thin films.	Appl. Phys. Lett. 99 (2011) 112502
24	**Komal Bapna**, D. M. Phase, and R. J. Choudhary	Study of valence band structure of Fe doped anatase TiO_2 thin films.	J. Appl. Phys. 110 (2011) 043910
25	**Komal Bapna**, R.J. Choudhary, and D.M. Phase	Structural properties of Fe doped TiO_2 films on $LaAlO_3$ and Si substrates.	Adv. Mat. Lett. 2 (2011) 281
26	Amit Khare, R. J. Choudhary, **Komal Bapna**, D. M. Phase, and Sankar P. Sanyal	Resonance photoemission studies of (111) oriented CeO_2 thin film grown on Si (100) substrate by pulsed laser deposition.	J. Appl. Phys. 108 (2010) 103712

Patents

Nil

Current Activities

(Not more than 100 words)

Involved in the calibration facility of Temperature and Humidity parameters from -200 ^oC to 3000 ^oC, established for Development of **Acoustic Gas Thermometry Primary Standard for Boltzmann Constant based New Kelvin** (undergoing project funded by CSIR, India), development of **testing facility for IR thermal imagers** first time at laboratory (project funded by CSIR, India), Development of **thin film humidity sensors, Infrared Detectors** and their metrological characterizations**,** the new Thermal Metrology of **thermal conductivity using the Guarded Hot Plate Method**, Development of **Fixed Point Blackbodies of Co-C and Ni-C** for contact and non-contact Thermometry.

Honour(s)/Award(s)/ Fellowship(s)

S. No.	Name of the Awards	Year	Awarding Org./ Inst.	Brief citation of the Award
1.	Best Poster Award	2020	AdMET, India	For the Best Poster Presentation at AdMET-2020, For development of Ni-C Fixed Point.
2	Best Poster	2018	DAE, India	For the Best Poster Presentation at DAE-

	Award			SSPS-2018
3	Best Paper presentation Award	2017	Sangam University, Bhilwara, Raj.	Annual International Conference on "Coping Change through Innovation and Value Creation for Society"
3	DST-Inspire faculty Award	2015	DST, India	To carry out research work independently on "Electronic and magnetic properties of some single-layered cobaltate based compounds".
4	Best Thesis Award	2013	DAE, India	For the Best Thesis presentation at DAE-SSPS, 2013 held at Thapar University.
5	Best Poster Award	2009	DAE, India	For the Best poster Presentation at DAE-SSPS-2009 held at University of Baroda.
6	Beat essay Writing	2003	University of Rajasthan (Raj)	(Dist. Level) at University of Rajasthan in "World Year of Physics", 2005.

Contributions to AcSIR

- **Assistant Professor** at AcSIR in **Faculty of Physical Sciences (since 2019)**.
- Guiding 2 Ph.D. students as **Guide** and 3 Ph.D. students as **Co-Guide**.
- **Member in AcSIR-NPL Diploma Course PMQC selection verification** committee, 2019.

Membership of Professional Societies/ Institutions

- Life membership **Metrology Society of India**.
- Life membership **Indian Society for Radiation Physics**.

Any other Information

S No	Duration of the visit	Institute and country of visit	Purpose of visit
1.	18-25 Apr. 2012	Indian Beamline, Photon Factory, KEK, Japan	Research Work - Experimental
2.	14-22 June 2016	Indian Beamline, Photon Factory, KEK, Japan	Research Work-Experimental
3.	12-18 Aug. 2019	Vienna University of Technology, Vienna, Austria.	To attend and present paper in Workshop on on "DFT based simulations of solids with the WIEN2k code"