Brief CV of V.K. Jindal

Superannuated as Professor and Coordinator of Nanoscience and Nanotechnology from the Department of Physics in Panjab University and is Re-employed now.

Important assignments:

- Member of National Selection Committee for **Fulbright-Nehru** Doctoral and Professional Research Fellowships. Under nomination from USIEF and Fulbright Foundations.
- Member of DRDO research funding board under ARMREB
- Executive Member Neutron Scattering Society of India (INSS)

Awards, Honours and achievements

- **Emeritus Scientist (CSIR)** 2010-2013
- Recipient of **Alexander von Humboldt fellowship (AvH)** of Germany (4 times and visited Germany at universities of Bayreuth in 1980, Wuerzburg in 2005, Munich in 2009 and TU Berlin in 2012)
- **Third World Academy of Science (TWAS)** awards scheme grant holder from Italian Government and visited University of Florence for one year in 1987.
- **BMFT (Ministry of Germany for Research and Technology)** research professor positions holder in Germany lasting over two years in 1980 and over one year in 1988.
- Visiting Fellow **Jawahar Lal Nehru Centre, IISc, Bangalore** (1993).
- **National Speaker** under Theoretical Physics Seminar Circuit (TPSC) in the year 1993.
- **D**euscher **A**kademischer **A**ustausch**d**ienst Senior Visiting Scientist in1995.
- **Fulbright Fellowship award** of USA, visited University of Illinois at Urbana-Champaign under this in 1996.
- Delivered special **C.V. Raman Memorial public lecture** on National Science Day at SMVD University, Katra on 28th Feb., 2009 under nomination by USIEF and Fulbright foundations.

He has published about 200 papers in international journals and conferences and symposia and headed research group and guided about a dozen Ph.Ds' and over 3 dozen M.Techs' and continues guiding research activities of the group. He is exposed to research in experimental and theoretical physics at highly established labs of the world like at Institute Laue Langevin (ILL), Grenoble and KFA, Julich. He has headed the condensed matter physics research group in physics department at Panjab University for over 10 years.

Research Statistics:

https://www.researchgate.net/profile/Vijay_Jindal/

http://scholar.google.co.in/citations?user=U50V1IgAAAAJ&hl=en

RG Score 56.53

Citations As per google scholar last five years:

	Since 2009
Citations	550
h-index	12
i10-index	16

For brevity, major research achievements of Prof. Jindal categorized decade wise and paragraphed are given below along with reference to his most important publications of that period. The nomenclature of decades is described as decade 1 clubbing the period (1980-1990), decade 2, the period (1990-2000) and 3 as post 2000.

In decade 1, the area of Anharmonicity of Solids was intensely explored, leading to famous publications giving a theory of simple as well as molecular crystals explaining the line widths and shifts of phonons in naphthalene (*J. Phys. C* **16**, 3061 (1983), *Phys. stat. sol. (b)* **133**, 189 (1986), *Phys. Rev. B* **38**, 4259-4268 (1988)). The codes written became very well known and were in use for a decade in his absence also. This was subsequently experimentally verified by using famous reactor at ILL, Grenoble in France, measuring phonon lifetimes and shifts in anthracene at temperatures from around 4K to room temperatures using their triple axis neutron inelastic spectrometer (*J. Phys. C* **15**, 7283-7294 (1982)).

In decade 2, in addition to continuity of decade 1, a new subject on viscoelastic materials – aqueous solutions of surfactants or micellar solutions was studied using Small Angle Neutron Scattering (SANS) Experiments performed again at ILL, Grenoble, France using SANS setup and a 2D detector; and at KFA, Julich, Germany. A real time transient behavior of these solutions was studied under application of shear gradient when the liquid crystalline behaviors organized itself and on its removal, when its decay took place. A theoretical model for the same was also suggested. The publication resulting from this is very well cited in literature (*J. Phys. Chem.* **94**, 3129 (1990)). During this decade, another applied problem of how materials break and how to control or prevent them from breaking under shock pressure was also studied. An application of the ideas was made by taking well studied sample earlier by us of naphthalene (*J. Appl. Phys*. **83**,5203, (1998)).

In decade 3, the subject of fullerenes and carbon nanotubes was in prime focus. A theoretical model that explained structural and thermodynamical properties of C_{60} was formulated (*Int. J. Mod. Phys.B*, **14**, 51-69 (2000)) and subsequently, similar model was suggested for carbon nanotube bunches (Phys. Rev. B **72**, Art. No. 165428 (2005)). Realizing the significance of new materials in the form of fullerenes and carbon Nanotubes, he was amongst first few to suggest and apply a model potential to calculate their structural properties which were reasonably close to measurements. His research group grew tremendously in this decade and devoted effort to understand

and suggest theoretical methodology for nanomaterials, especially carbon nanotubes, experimenting with ion irradiation on these (J. Appl. Phys. **94**, 326-333 (2003), J. Appl. Phys. **104**, 054306 (2008)), including boron-nitride tubes (Nanotechnology **18** 435711 (2007)), and also attending to their production techniques. Important contributions have also been made predicting structure of carbon Nanotubes based on two bond lengths which have further been studied under high pressures (Phys. Rev. B **76**, 195447 (2007), CARBON **447**, 3247-51 (2009) CARBON **46**, (2008) 349-358, CARBON **48**, 744-55 (2010)). Suggestion has been made that this pressure dependent nature of bond lengths can be exploited to characterize carbon nanotubes of various chiralities. This is an important contribution. Also in focus were electronic properties of C_{60} under hetero substitution of carbons by nitrogen or boron atoms, encapsulating polynitrogen complexes inside C_{60} resulting in a suggestion of new source of green energy (Phys. Chem A, 113, 9002-13 (2009) , *J. Phys. Chem. C*, *114*, 9153–9160 (2010)). We have also investigated the role of N atom dopants and transition metal atoms in ZnO clusters in inducing ferromagnetism (J Phys-Cond. Matter **23**, 44 (2011) and Nanoscale **3,** 217-224 (2011)).
Recently, results on designing band gap of graphene by B and N dopant atoms have been published (*RSC Adv*.**, 2013, 3 (3), 802 – 812).**

List of publications V K Jindal

1. Kumar S, Kaur I, Kumari N, et al. Atomic force microscope manipulation of multiwalled and single walled carbon nanotubes with reflux and ultrasonic treatments. *Appl. Nanosci.* 2014;4(1):19–26.

2. Rani P, Dubey GS, Jindal VK. DFT study of optical properties of pure and doped Graphene. *Phys. E Low-dimensional Syst. Nanostructures*. 2014;62:28–35.

3. Rani P, Jindal VK. A DFT Study of B, N and BN Doped Graphene. *MRS Proc.* 2014;1701:mrss14–1701.

4. Sharma S, Verma AS, Bhandari R, Jindal VK. Ab initio studies of structural, elastic and thermal properties of copper indium dichalcogenides (CuInX< sub> 2</sub>: X= S, Se, Te). *Comput. Mater. Sci.* 2014;86:108–117.

5. Sharma S, Verma AS, Bhandari R, Kumari S, Jindal VK. Ab initio studies of structural, electronic, optical, elastic and thermal properties of Ag-chalcopyrites (AgAlX< sub> 2</sub>: X= S, Se). *Mater. Sci. Semicond. Process.* 2014;26:187–198.

6. Sharma S, Verma AS, Jindal VK. Ab initio studies of structural, electronic, optical, elastic and thermal properties of silver gallium dichalcogenides (AgGa< i> X</i>< sub> 2</sub>:< i> X</i>= S, Se, Te). *Mater. Res. Bull.* 2014;53:218–233.

7. Sharma S, Verma AS, Jindal VK. First principles studies of structural, electronic, optical, elastic and thermal properties of Ag-chalcopyrites (AgInX< sub> 2</sub>: X= S, Se). *Phys. B Condens. Matter*. 2014;438:97–108.

8. Jindal VK, Dharamvir K, Suman V, Tsomo M. Carbon Nanotubes Production Using Arc Ignition Under Magnetic Field. *arXiv Prepr. arXiv1308.5819*. 2013.

9. Rani B, Jindal VK, Dharamvir K. Adsorption configurations of two nitrogen atoms on graphene. In: *SOLID STATE PHYSICS: Proceedings of the 58th DAE Solid State Physics Symposium 2013*.Vol 1591.; 2014:450–452.

10. Rani B, Jindal VK, Dharamvir K. Interaction of nitrogen molecule with graphene. In: *SOLID STATE PHYSICS: PROCEEDINGS OF THE 57TH DAE SOLID STATE PHYSICS SYMPOSIUM 2012*.Vol 1512.; 2013:300–301.

11. Rani B, Jindal VK, Dharamvir K. Interaction of two nitrogen molecules with graphene. In: *PROCEEDING OF INTERNATIONAL CONFERENCE ON RECENT TRENDS IN APPLIED PHYSICS AND MATERIAL SCIENCE: RAM 2013*.Vol 1536.; 2013:363–364.

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