Professor Ashutosh Ghosh, FASc

Vice-Chancellor
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Date of Birth : December 29, 1959

EDUCATIONAL QUALIFICATIONS

Ph.D. Jadavpur University, 1987
M. Sc. (Chemistry), University of Calcutta, 1981
B. Sc. (Chemistry Honours), Presidency College, University of Calcutta, 1979

POST-DOCTORAL RESEARCH/ VISITING ASSIGNMENTS

UNESCO Fellow	Charles University, Prague, Czechoslovakia; September, 1987-June, 1988; Research Field: Polarographic and Voltammetric Analysis
MONBUSHO Fellow	Department of Chemistry, Nagoya University, Nagoya, Japan; September, 1989-October, 1990; Research Field: Molecular Dynamics, Solid State NMR
JSPS Fellow	Department of Chemistry, Tsukuba University, Tsukuba, Japan; March, 1996-January, 1997; Research Field: Molecular Dynamics, NMR Relaxation Time
Visiting Scientist	Department of Chemistry, University of Utah, Salt Lake City, USA; September, 2004-September, 2005; Research Field: Supramolecular Chemistry
Short Term Visiting Professor (**INSA-DFG bilateral exchange program**)	University of Dusseldorf and University of Munster, Germany; 30 September, 2014 - 21 October, 2014.

POSITIONS HELD

Lecturer (1990-1995) and **Senior Lecturer** (1995–1997) in Government Colleges, West Bengal (Jhargram Raj College and Bidhannagar Government College)

Senior Lecturer (1998–1999), **Reader** (1999–2005), **Professor** (2005 -) and **Head** (2011-2013), Department of Chemistry, University of Calcutta. **Dean,** Faculty Council for Postgraduate Studies in Science (August, 2013-July, 2016) University of Calcutta

Supervision of Ph.D. Thesis: Seventeen students have been awarded Ph.D. degree and eight pre-doctoral students are working at present.

AWARD

Rheometric Scientific-ITAS Award (1995): Presented by the Indian Thermal Analysis Society for "outstanding contributions in the field of thermal analysis".

CRSI Bronze Medal (2016): Presented by Chemical Research Society of India "in recognition of contributions to research in chemistry".

Fellow: West Bengal Academy of Science and Technology (WAST)

Fellow: Indian Academy of Science (Bangalore)

RECENT INVITED LECTURES

- Bronze Medal Lecture at 19th CRSI National Symposium in Chemistry (NSC-19); North Bengal University, Siliguri (Darjeeling); July 14-16, 2016.
- *Modern Trends in Molecular Magnetism;* May 19-21, 2016, IIT-Bombay, Mumbai
- "Acharya Prafulla Chandra Ray Memorial Lecture" on *Life and Works of Acharya P. C. Ray;* May 13, 2016*,* Department of Chemistry, Asutosh College, Kolkata
- One-day National Symposium on *Chemical Science*; March 12, 2016, University of Gour Banga, West Bengal
- Lead Lecture on the 23rd West Bengal State Science and Technology Congress; February 29, 2016, Presidency University, Kolkata
- Indo-New Zeeland Symposium on *Molecular Chemistry and its Perspectives*; November 17, 2015, Centre of Research in Nanoscience and Nanotechnology (CRNN), University of Calcutta
- "Science Academies" Lecture Workshop on *Supramolecular Assemblies: Synthesis and Application*; August 21-22, 2015, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarg
- National Conference on *Current Perspectives on Research on Chemical Sciences (CPRCS-2015);* March, 25-26, 2015, Assam University, Silchar, Assam
- International Conference on *Structural and Inorganic Chemistry*; December, 4-5, 2014, NCL and IISER Pune
- Delivered lecture as visiting fellow; October 24, 2014, University of Valencia, Valencia, Spain
- Delivered lecture as a part of *INSA-DFG bilateral exchange program;* October 14, 2014, University of Munster, Munster, Germany
- Delivered lecture as a part of *INSA-DFG bilateral exchange program;* October 8-10, 2014, University of Dusseldorf, Dusseldorf, Germany
- One-day Seminar on *Chemistry*; September 12, 2014, University of North Bengal, Darjeeling, West Bengal
- National Symposium on *Sustainable Chemistry : Frontiers and Challenges*; February 27- March 1, 2014, NEHU, Shillong

- 15th Biennial Symposium on *Modern Trends in Inorganic Chemistry (MTIC-XV)*; December 13-16, 2013, Indian Institute of Technology Roorkee, Uttrakhand
- UGC - Sponsored State Level Seminar on *Chemistry : Development from the Past to the Future*; May 8, 2013, Panihati Mahavidyalaya, Sodepur, West Bengal
- National Symposium on *Recent Trend in Chemical Sciences*; March 22-23, 2013, Manipur University, Imphal

PUBLICATIONS

239 papers have been published in journals of international repute. Among these, 177 papers have been published since joining the University of Calcutta in 1998 and starting independent research. Summary of the publications from the University of Calcutta:

ACS journals: 31 (IC-25, CG&D-4, OL-1, Om-1)
RSC journals: 31 (Dalton Trans.-23, CEC-6, Chem Commun.-1, RSC Adv.–1)
Willey journals: 21 (EJIC-18, Chem.-Eur. J-2, ChemistrySelect-1)
Elsevier journals: 75(Polyhedron-38, ICA-27, ICC-7, JMS-2, Magnetochemistry-1)
Others: 19

h-index: 38 *(Scopus, as on 2nd June, 2017)*

SELECTED PUBLICATIONS

- Mahapatra, P., Ghosh, S., Giri, S., Rane, V., Kadam, R., Drew, M., **Ghosh, A.(2017)** "Subtle structural changes in $(Cu^{II}L)_2Mn^{II}$ complexes to induce heterometallic cooperative catalytic oxidase activities on phenolic substrates (H_2L = salen type unsymmetrical Schiff base)" *Inorganic Chemistry*, Vol. 56, No. 9, pp. 5105-5121.

  Mondal, M., Giri, S., Guha P. M., and **Ghosh, A. (2017)** "Dependence of magnetic coupling on ligands at the axial positions of Ni^{II} in phenoxido bridged dimers: experimental observations and DFT studies" *Dalton Transaction*s, Vol. 46, pp. 697-708.

  Ghosh, S., Gómez García, C. J., Clemente-Juan, J. M. and **Ghosh, A. (2016)**, "Key role of size and electronic configuration on the sign and strength of the magnetic coupling in a series of Cu_2Ln trimers (Ln = Ce, Gd, Tb, Dy and Er), *Magnetochemistry, Vol.* 2 No. 1, *pp.* 2.

- Hazari, A., Das, L. K., Bauzá, A., Frontera A. and **Ghosh, A. (2016),** "Exploring the coordinative adaptation and molecular shapes of trinuclear $Cu^{II}_2M^{II}$(M = Zn/Cd) complexes derived from salen type Schiff bases: structural and theoretical studies", *Dalton Transaction*s, Vol. 45, pp. 5730-5740.

- Ida, Y., Ghosh, S., **Ghosh**, **A.,** Nojiri, H. and Ishida T. **(2015)**, "Strong ferromagnetic exchange interactions in hinge-like Dy(O2Cu)2 complexes involving double oxygen bridges", *Inorganic Chemistry*, Vol. 54 No. 19, pp. 9543-9555.

- Das, L.K., Diaz, C. and **Ghosh, A. (2015), "**Antiferromagnetic mixed-valence Cu(I)−Cu(II) two-dimensional coordination polymers constructed by double Oximato Bridged Cu(II) Dimers and $Cu^{I}SCN$ based one-dimensional Anionic Chains", *Crystal Growth & Design***,** Vol. 15 No. 8, pp. 3939-3949.

- Seth, P., Giri, S. and **Ghosh A. (2015**), "Tuning of exchange coupling by the Mn–O distance and phenoxido bridging angle: an experimental and theoretical study of the family of Mn(III) dimers with salen type ligands", *Dalton Tranactions*, Vol. 44, pp. 12863-12870.

- Ghosh, S., Aromí, G., Gamez P. and **Ghosh A. (2015)**, **"**Structural and magnetic analysis of retrosynthetically designed architectures built from a triply bridged heterometallic $(CuL)_2Co$ node and benzenedicarboxylates", *European Journal of Inorganic Chemistry,* Vol. 2015 No. 18, pp. 3028–3037.

- Seth, P., Figuerola, A., Jover, J., Ruiz, E. and **Ghosh, A. (2014)**, "Ferro-to antiferromagnetic crossover angle in diphenoxido and carboxylato-bridged trinuclear Ni^{II}_2–Mn^{II} complexes: Experimental observations and theoretical rationalization", *Inorganic Chemistry*, Vol. 53 No. 17, pp. 9296–9305.

- Ghosh, S., Ida, Y., Ishida, T. and **Ghosh, A. (2014)**, "Linker stoichiometry controlled stepwise supramolecular growth of a flexible Cu_2Tb single molecule magnet from monomer to dimer to 1D chain", *Crystal Growth & Design*, Vol. 14 No. 5, pp. 2588–2598.

- Hazari, A., Das, L. K., Bauzá, A., Frontera, A. and **Ghosh, A. (2014)**, "The influence of H-bonding on the 'ambidentate' coordination behaviour of thiocyanate ion to Cd(II): A combined experimental and theoretical study", *Dalton Transactions,* Vol. 43, pp. 8007-8015.

- Biswas, S., Gómez-García, C. J., Clemente-Juan, J. M., Benmansour, S. and **Ghosh, A. (2014)**, "Supramolecular 2D/3D isomerism in a compound containing heterometallic $Cu^{II}_2Co^{II}$ nodes and dicyanamide bridges", *Inorganic Chemistry*, Vol. 53 No.5, pp. 2441–2449.

- Das, L.K., Biswas, A., Gómez-García, C. J., Drew, M. G. B. and **Ghosh A. (2014)**, "Isolation of two different Ni_2Zn complexes with an unprecedented cocrystal formed by one of them and a "coordination positional isomer" of the other", *Inorganic Chemistry*, Vol. 53 No. 1, pp. 434 - 445.

- Seth, P., Ghosh, S., Figuerola A. and **Ghosh, A. (2014)**, "Trinuclear heterometallic Cu^{II}–Mn^{II} complexes of a salen type Schiff base ligand: anion dependent variation of phenoxido bridging angles and magnetic coupling", *Dalton Transactions,* Vol. 43, pp. 990–998.

- Das, L. K. , Biswas, A., Kinyon, J. S., Dalal, N. S., Zhou, H. and **Ghosh, A. (2013)**, "Di-, Tri-, and Tetranuclear Nickel(II) complexes with oximato bridges: Magnetism and catecholase-like activity of two tetranuclear complexes possessing rhombic topology", *Inorganic Chemistry*, Vol. 52 No. 20, pp. 11744–11757**.**

- Ghosh, S., Mukherjee, S., Seth, P., Mukherjee, P. S. and **Ghosh, A. (2013)**, **"**Solvent-templated supramolecular isomerism in 2D coordination polymer constructed by $Ni^{II}_2Co^{II}$ node and dicyanamido spacer: Drastic change in magnetic behaviours", *Dalton Transactions,* Vol. 42, pp. 13554-13564.

- Ghosh, S., Biswas, S., Bauzá, A., Barceló-Oliver, M., Frontera, A. and **Ghosh, A. (2013), "**Use of metalloligands [CuL] (H_2L = salen type di-Schiff bases) in the formation of heterobimetallic copper(II)-uranyl complexes: Photophysical investigations, structural variations and theoretical calculations", *Inorganic Chemistry,* Vol. 52 No. 13, pp. 7508-7523.

- Das, L.K. and **Ghosh, A. (2013)**, "Structural diversity in the complexes based on a hetero-trimetallic Cu_2Cd node and dicyanamide spacer: A hexanuclear cluster, a 1D stair polymer and a 1D zigzag chain as supramolecular isomers, and a 3D network", *CrystEngComm*, Vol. 15, pp. 9444 – 9456.

- Biswas, R., Ida, Y., Baker, M. L. , Biswas, S., Kar, P., Nojiri, H., Ishida, T. and **Ghosh, A (2013)**, "A new family of trinuclear nickel(II) complexes as single-molecule magnets", *Chemistry : A European Journal,* Vol. 19 No. 12, pp. 3943-3953.

- Das, L.K., Kadam, R.M., Bauzá, A., Frontera, A. and **Ghosh, A. (2012)**, "Differences in nuclearity, molecular shapes, and coordination modes of azide in the complexes of Cd(II) and Hg(II) with a "metalloligand" [CuL] (H_2L = N,N′‑Bis(salicylidene)-1,3-propanediamine): Characterization in solid and in solutions, and theoretical calculations", *Inorganic Chemistry*, Vol. 51 No.22, pp. 12407–12418.

- Biswas, A., Das, L. K., Drew, M.G.B., Diaz, C. and **Ghosh, A. (2012)**, **"**Insertion of a hydroxido bridge into a diphenoxido dinuclear copper(II) complex : drastic change of the magnetic property from strong antiferromagnetic to ferromagnetic and enhancement in the catecholase activity", *Inorganic Chemistry,* Vol. 51 No.19, pp. 10111–10121.

- Biswas, A., Das, L.K., Drew, M.G.B., Aromí, G., Gamez, P. and **Ghosh A. (2012), "**Synthesis, crystal structures, magnetic properties and catecholase activity of double phenoxido-bridged penta-coordinated dinuclear nickel(II) complexes derived from reduced Schiff-Base ligands : Mechanistic inference of catecholase activity", *Inorganic Chemistry,* Vol. 51 No. 15, pp. 7993–8001.

- Biswas, A., Estarellas, C., Frontera, A., Ballester, P., Drew, M.G.B., Gamez, P. and **Ghosh, A. (2012)**, **"**Effect of a methyl group on the spontaneous resolution of a square-pyramidal coordination compound: crystal packing and conglomerate formation", *CrysEngComm*, Vol. 14, pp. 5854–5861.

- Das, L.K., Park, S. –W., Cho, S. J. and **Ghosh, A.** (**2012), "**An unprecedented "linear-bent" isomerism in trinuclear $Cu_2^{II}Zn^{II}$ complexes with salen type di-Schiff base ligands", *Dalton Transaction,* Vol. 41, pp. 11009-11017.

- Biswas, R., Mukherjee, S., Kar, P. and **Ghosh, A.** (**2012)**, **"**A rare phenoxido/acetato/azido bridged trinuclear and an unprecedented phenoxido/azido bridged one-dimensional polynuclear nickel(II) complexes: synthesis, crystal structure, and magnetic properties with theoretical investigations on the exchange mechanism", *Inorganic Chemistry*, Vol. 51 No. 15, pp. 8150–8160.

- Naiya, S., Biswas, S., Drew, M.G.B., Gómez-García, C.J. and **Ghosh**, **A. (2012)**, "A ferromagnetic methoxido-bridged Mn(III) dimer and a spin-canted metamagnetic $\mu_{1,3}$-azido-bridged chain", *Inorganic Chemistry,* Vol. 51 No. 9, pp. 5332–5341.

- Biswas, R., Giri, S., Saha, S.K. and **Ghosh, A. (2012)**, "One ferromagnetic and two antiferromagnetic dinuclear nickel(II) complexes derived from a tridentate N,N,O-donor Schiff Base ligand : A density functional study of magnetic coupling", *European Journal of Inorganic Chemistry*, Vol. 2012, No. 17, 2916–2927.

- Kar, P., Haldar, R., Gómez-García, C.J. and **Ghosh A. (2012)**, "An antiferromagnetic porous metal-organic framework containing mixed-valence $[Mn^{II}_4Mn^{III}_2(\mu_4O)_2]^{10+}$ units with catecholase activity and selective gas adsorption", *Inorganic Chemistry,* Vol. 51 No. 7, pp. 4265–4273.

- Seth, P., Das, L.K., Drew, M.G.B. and **Ghosh, A. (2012)**, "Synthesis, crystal structure and catecholase activity of three trinuclear heterometalic Ni^{II}_2-Mn^{II} complexes derived from a salen type Schiff base ligand", *European Journal of Inorganic Chemistry*, Vol. 2012 No. 13, pp. 2232-2242.

- Biswas, S., Naiya, S., Gómez-García, C.J. and **Ghosh**, **A**. **(2012)**, "Synthesis of the first heterometalic star-shaped oxido-bridged $MnCu_3$ complex and its conversion into trinuclear species modulated by pseudohalides ($N3^-$, NCS^- and NCO^-): Structural analyses and magnetic properties", *Dalton Transactions,* Vol. 41, pp. 462-473.

- Kar, P., Biswas, R., Ida, Y., Ishida, T. and **Ghosh, A. (2011), "**A unique example of structural diversity tuned by apparently innocent *o*-, *m*- and *p*-nitro substituent of benzoate in their complexes of Mn(II) with 4,4′-bipyridine: 1D ladder, 2D sheet and 3D framework", *Crystal Growth & Design*, Vol. 11 No. 12, pp. 5305–5315.

- Biswas R., Kar, P., Song Y. and **Ghosh, A. (2011),** "The importance of an additional water bridge in making the exchange coupling of bis(μ-phenoxo) dinickel(II) complexes ferromagnetic", *Dalton Trans*actions, Vol. 40, pp. 5324-5331.

- Kar, P., Mukherjee, P., Drew, M.G.B., Ishida, T. and **Ghosh, A. (2011)**, "Spin canted antiferromagnetic phase transition in alternating phenoxo and carboxylato bridged Mn(III)-Salen complexes", *European Journal of Inorganic Chemistry,* Vol. 2011 No. 13, pp. 2075-2085.

- Naiya, S., Wang, H-S., Drew, M. G. B., Song, Y. and **Ghosh, A. (2011)**, "Structural and magnetic studies of Schiff base complexes of nickel(II) nitrite: change in crystalline state, ligand rearrangement and a very rare μ-nitrito-1κO:2κN:3κO' bridging mode", *Dalton Transactions*, Vol. 40, pp. 2744-2756.

- Biswas, A., Drew, M.G.B., Gómez-García C. J., and **Ghosh, A. (2010), "**Use of a reduced Schiff-base ligand to prepare novel chloro-bridged chains of rare Cu(II) trinuclear complexes with mixed azido/oxo and chloro/oxo bridges", *Inorganic Chemistry,* Vol. 49 No. 17, pp. 8155–8163.

- Naiya, S., Biswas, C., Drew, M.G.B., Gómez-García, C.J., Clemente-Juan, J.M. and **Ghosh, A. (2010)**, **"**A unique example of structural and magnetic diversity in four inter-convertible Cu(II) azide complexes with the same Schiff base ligand: a monomer, a dimer, a chain and a layer", *Inorganic Chemistry*, , Vol. 49 No. 14, pp. 6616–6627.

- Biswas, C., Drew, M.G.B., Ruiz, E., Estrader, M., Diaz, C. and **Ghosh, A. (2010)**, **"**Synthesis, crystal structure and magnetic properties of three unprecedented tri-nuclear and one very rare tetra nuclear copper(II) Schiff-base complexes supported

by mixed azido/phenoxo/nitrato or acetato bridges", *Dalton Transactions*, Vol. 39, pp. 7474-7484.

- Mukherjee, P., Drew, M. G. B., Gómez-García, C. J. and **Ghosh, A. (2009)**, "The crucial role of polyatomic anions in molecular architecture: Structural and magnetic versatility of five nickel(II) complexes derived from a N,N,O-Donor Schiff base ligand", *Inorganic Chemistry*, Vol. 48, No. 13, pp. 5848–5860.

- Mukherjee, P., Drew, M. G. B., Gómez-García, C. J. and **Ghosh, A. (2009)**, "(Ni_2), (Ni_3) and (Ni_2 + Ni_3): A unique example of isolated and cocrystallized Ni_2 and Ni_3 complexes", *Inorganic Chemistry*, Vol. 48 No. 11, pp. 4817–4827.

- Biswas, C., Drew, M. G. B., Escudero, D., Frontera, A. and **Ghosh**, **A. (2009)**, "Anion–π, lone-pair–π, π–π and hydrogen-bonding interactions in a Cu^{II} complex of 2-picolinate and protonated 4,4'-bipyridine: Crystal structure and theoretical studies", *European Journal of Inorganic Chemistry,* Vol. 2009 No. 15, pp. 2238–2246.

- Mukherjee, P., Drew, M.G.B., Estrader, M. and **Ghosh, A. (2008),** "Coordination-driven self-assembly of a novel carbonato-bridged heteromolecular neutral nickel(II) triangle by atmospheric CO_2 fixation", *Inorganic Chemistry,* Vol. 47, No. 17, pp. 7784-7791.

- Chattopadhyay, S., Drew, M.G.B. and **Ghosh, A. (2008)**, **"**Methylene spacer-regulated structural variation in cobalt(II/III) complexes with bridging acetate and Salen- or Salpn-type Schiff-base ligands", *European Journal of Inorganic Chemistry,* Vol. 2008 No.10, pp. 1693–1701.

- Biswas, C., Mukherjee, P., Drew, M.G.B., Gómez-García, C.J., Clemente-Juan, J.M. and **Ghosh, A.** (**2007**), "Anion-directed synthesis of metal-organic frameworks based on 2-picolinate Cu(II) complexes: A ferromagnetic alternating chain and two unprecedented ferromagnetic fish backbone chains", *Inorganic Chemistry*, Vol. 46 No. 25, pp. 10771-10780.

- Sarkar, B., Sinha Ray, M., Li, Y.-Z., Song, Y., Figuerola, A., Ruiz, E., Cirera, J., Cano, J. and **Ghosh, A.** (**2007**), "Ferromagnetic coupling in trinuclear, partial cubane Cu^{II} complexes with a μ_3-OH core: magneto-structural correlations", *Chemistry: A European Journal*, Vol. 13, No. 33, pp. 9297-9309.