Dr. Chinmoy Ranjan

Assistant Professor
Department of Inorganic and Physical Chemistry
Indian Institute of Science, Bengaluru
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Education

Cornell University, Ithaca, NY, USA. (2002-2007)
Ph.D. in Chemistry
Advisors: Prof. Roald Hoffmann and Prof. Francis DiSalvo
Field: Inorganic Solid State Chemistry and Theoretical Chemistry
Thesis: Theoretical and experimental studies on electrocatalysts for PEM fuel cells.

Indian Institute of Technology Kanpur, UP, India. (1997-2002)
Master of Science in Chemistry (Integrated)
Thesis: DFT based studies on the active site of sulfite oxidase enzyme. (Best project award)
Advisor: Prof. Sabyasachi Sarkar

Professional Experience

Indian Institute of Science, Bengaluru, India (2017- present)
Assistant professor
Department of Inorganic and Physical Chemistry
Principal Investigator at Electrochemistry and In situ Spectroscopy Lab

Max Planck Institute for Chemical Energy Conversion, Muelheim, Germany. (2012- 2017)
Group leader
Department of Heterogeneous Reactions
Principal Investigator: Development and in-situ characterization of electrocatalysts for water oxidising anode.

Fritz Haber Institute of the Max Planck Society, Berlin, Germany. (2010 - 2012)
Department of Inorganic Chemistry
Principal Investigator: Electrochemical and X-ray spectroscopy studies on water oxidation catalysts.

Intel Corporation, Hillsboro, OR, USA. (2007 - 2010)
Senior Scientist-Thin films
Portland Technology Development

Research Area: Electrochemical Energy Storage and Conversion

Representative Publications

Book Section

◦ In situ Raman spectroscopy for probing solar fuels reactions. Topics in Current Chemistry: Solar Fuels 2015, Springer, *(Invited)*

Journal Articles

◦ Microwave Assisted Synthesis of Stable and Highly Active Ir-oxohydroxides for Electrochemical Oxidation of Water Cyriac Masseue, Xing Huang, Andrey Tarasov, Chinmoy Ranjan, Sebastian Cap, Robert Schloegl *Chem.Sus.Chem. 2017*

◦ Probing the structure of water oxidising anodic Iridium oxide catalyst using Raman spectroscopy. Zoran Pavlovic, Chinmoy Ranjan*, Qiang Gao, Maurice van Gastel, Robert Schloegl. *ACS Catalysis 2016, 6 (12), 8098-8105*

◦ Characterization of Platinum and Iridium Oxyhydrate Surface Layers from Platinum and Iridium Foils. Benjamin Johnson, Chinmoy Ranjan, Mark Greiner, Rosa Arrigo, Manfred, Erwin Schuster, Britta Hoepfner, Mihaela Gorgoi, Iver Lauermann, Marc Willinger, Axel Knop-Gericke, and Robert Schloegl. *Chem.Sus.Chem. 2016,9,1634-1646*

◦ Enhancement of stability and activity of MnO_x/Au electrocatalysts for oxygen evolution through adequate electrolyte composition. Qiang Gao, Chinmoy Ranjan*, Zoran Pavlovic, Raoul Blume, Robert Schloegl. *ACS Catalysis 2015, 5, 7265-7275.*

◦ Electrochemical degradation of multi wall carbon nanotubes at high anodic potential for oxygen evolution in acidic media. Youngmi Yi, Julian Tornow, Elena Willinger, Marc Willinger, Chinmoy Ranjan, Robert Schloegl. *ChemElectroChem. 2015, 2, 1929 - 1937*

◦ In Situ Study of the Gas-Phase Electrolysis of Water on Platinum by NAP-XPS. Rosa Arrigo, Michael Haevecker, Manfred E. Schuster, Chinmoy Ranjan, Axel Knop-Gericke, Robert Schloegl. *Angewandte Chemie International Edition 2013, 125(44), 11874-11879.*

◦ Catalyst supports for polymer electrolyte fuel cells. Chinmayee Subban, Qin Zhou, Brian Leonard, Chinmoy Ranjan, Heather M. Edvenson, F. J. DiSalvo, Semeret Munie, and Janet Hunting. *Phil. Trans. R. Soc. A 2010 368, 3243-3253.*

◦ Synthesis, crystal and electronic structures of $La_3Cr_2N_6$. Francois Chevire, Chinmoy Ranjan, Francis J. DiSalvo. *Solid State Communications 2009, 149(7-8), 273-276.*

◦ Two novel Zintl compounds $Na_{12}Ge_8Sn$ and $Na_{15}Ge_8SnP$: Single crystal and electronic structures. Yong K. Dong, Chinmoy Ranjan, Francis J. DiSalvo. *Solid State Sciences 2008, 10(5), 525-532.*

◦ Two polymorphs of $Ba_3Sn_2P_4$: Single crystal and electronic structures. Yong K. Dong, Chinmoy Ranjan, Francis J. DiSalvo. *Journal of Alloys and Compounds 2007, 430(1-2), 54-59.*

◦ Electronic effects in CO chemisorption on PtPb intermetallic surfaces: A theoretical study. Chinmoy Ranjan, Roald Hoffmann, Francis J. DiSalvo, Héctor D. Abruña. *J. Phys. Chem. C 2007, 111 (46), 17357-17369*

◦ $Cu_4Mo_6Se_8$: Synthesis, crystal structure and electronic structure of a new Chevrel-phase polymorph. Michael A. Maguire, Chinmoy Ranjan, and Francis J. DiSalvo. *Inorganic Chemistry 2006,*

45(6), 2718-2726.

Representative presentations and lectures

- Electrocatalysis: basic concepts and applications. Chinmoy Ranjan *Invited Lecture for graduate level students, International Max Planck Research School-Berlin, June 2012*

- Electron and proton transfer reactions: An electrochemical perspective. Chinmoy Ranjan *Invited Lecture for graduate level students, International Max Planck Research School-Muelheim an der Ruhr, Nov 2015*

- Electrochemical oxidation of Pt: From single crystal degradation to anodically grown oxides. Chinmoy Ranjan, Rosa Arrigo, Manfred E. Schuster, Robert Schl gl, Markus Eiswirth, Benjamin Johnson, Frank Girgsdies, Gisela Weinberg, Axel Knop-Gericke, Julian Tornow. *Invited Talk, Ertl Symposium, Stuttgart, June 2012*

- In-situ Raman Spectroscopic studies on Manganese and Iridium oxide electrodes: Structural dynamism and corrosion. Chinmoy Ranjan, Zoran Pavlovic, Qiang Gao, Robert Schloegl. *Invited Talk, Ertl Symposium, Berlin, June 2014*

- In-situ Raman Spectroscopic studies on Manganese and Iridium oxide electrodes: Structural dynamism and corrosion. Zoran Pavlovic, Chinmoy Ranjan, Zoran Pavlovic, Qiang Gao, Robert Schloegl. *Best paper award - Weimar Conference, German Chemical Society, 2016*

- Electrochemical oxidation of single crystals of Pt. Chinmoy Ranjan, Robert Schloegl, Markus Eiswirth. *5th International Conference on hydrogen and energy. Stoos, Switzerland, Jan 2011*

- Theoretical models of Pt-intermetallic surfaces under electrochemical conditions: Prevention of CO poisoning in fuel cell electrocatalysts. Chinmoy Ranjan, Roald Hoffmann, Francis J. DiSalvo, Hector D. Abruna, Matthew Neurock. *Materials Research Society, Fall meeting, Boston 2006*

- Oxide catalysts and supports for oxygen reduction reaction in fuel cells. Chinmoy Ranjan, Lin Zhuang, Neal Abrams, Hector D. Abruna, Francis J. DiSalvo. *Gordon Research Conference, Solid State Chemistry, New Hampshire, July 2006*

- Formate adsorption on PtPb(001) and (100) surfaces, possibilities of a bifunctional mechanism in removal of CO from PtPb. Chinmoy Ranjan, Hector D. Abruna, Francis J. DiSalvo, Roald Hoffmann. *Center for Advanced Technology meeting, RPI, Troy, NY, Nov 2004*