



IIT MADRAS

K. K. BALASUBRAMANIAN INSTITUTE CHAIR REPORT



K. K. BALASUBRAMANIAN INSTITUTE CHAIR



Prof. K. K. Balasubramanian
Dept. of Chemistry
IIT Madras

Prof. Kalpattu Kuppusamy Balasubramanian, affectionately known to everyone as Prof. KKB, is currently an Adjunct Faculty member in the Chemistry Department of IIT Madras. He joined IIT Madras as a Lecturer and became a professor in 1991. His major areas of research include **synthetic organic chemistry, heterocyclic chemistry, carbohydrate chemistry, medicinal chemistry, electro-organic chemistry, organic photochemistry, molecular rearrangements and process development for pharmaceutical industry APIs and intermediates**. He is a Fellow of the Indian National Science Academy and Indian Academy of Science. He received several honours and awards, namely, Lifetime Achievement Award of the Chemical Research Society of India, Prof. KKB received TR Govindachari 60th Birthday Commemoration Award, the Fr Yedanapalli Memorial Lecture and Prof. S. Swaminathan 60th Birthday Commemoration Lecture of INSA (2000), Lifetime Achievement Award by the Chemical Research Society of India. He has published extensively in all the fields above with more than **180 publications** in peer reviewed **national and international journals**

After retirement he continues to be actively providing his guidance to serve Pharma industries viz. Shasun Chemicals and Drugs Ltd., Alpha Amins, Kawman Pharma, Anjan Drugs, Amrutanjan Ltd, etc for nearly 20 years and still continuing. He is one of the sought-after speakers by colleges and universities for motivating students to pursue research. He supports the student community by delivering chemistry talks and motivating lectures to students preparing for CSIR scholarship qualifying examinations.

OCCUPANT OF THE K. K. BALASUBRAMANIAN INSTITUTE CHAIR



Prof. S. Sankararaman
Dept. of Chemistry
IIT Madras

Professor S. Sankararaman, is currently an Institute Chair Professor in the Department of Chemistry since the year 2017. Professor Sankararaman is among the most distinguished organic chemists in India and abroad and has guided **19 Ph.D** students for the award of their degrees and has four students currently as a joint guide. In addition, more than **30 M.Sc.** Students have done their project under his supervision. His research publications cover all forms of peer reviewed publications, namely, books, chapters in monographs, review articles and journal publications. The book entitled "**Pericyclic Reactions: A Text Book**" by him as the sole author was also reviewed and with a very appreciative Foreword by the **Nobel Laureate Professor Roald Hoffmann** of Cornell University, a pioneer in the same area. It is a **five-star rated text book** on the **Amazon site**. He is a **Bronze Medallist** from the Chemical Research Society of India and is an **Elected Fellow** of the Indian Academy of Sciences Bengaluru and the Indian National Science Academy. He has also coordinated numerous nationally and internationally funded research projects and is among the most sought-after speakers and reviewers in Organic chemistry in India today.

He spent a year on sabbatical leave at the Institute of Organic Chemistry, Technical University of Braunschweig, Germany, as an **Alexander von Humboldt Fellow** in the laboratory of Prof. Henning Hopf with whom he had established collaborative research.

His contributions to institute administrative activities are far and wide as well. He was the **Head of the Department of Chemistry** for two years, **Head of the Sophisticated Analytical Instrument Facility** in IIT Madras, and Chairman of the Central Glass Blowing Section. He was also the **Chairman** of the Joint Entrance Examination in the year 2008 and is currently the **Chief Vigilance Officer** (Part-Time) which he accepted in 2013. There are very few in our Institute and in India who have contributed so extensively and with brilliance for all the four pillars of any University, academic research, teaching, administration and bringing in research funds through external projects, then **Prof. Sankararaman**.

STUDENTS' CONTRIBUTIONS (WHO WERE INVOLVED IN RESEARCH)

- Ph.D. Students guided: 19 students have completed Ph.D
- MSc project students guided: 35 students

For more details



RESEARCH INTERESTS

- Organic synthesis - synthesis of un-natural organic molecules.
- Chemistry of D₂ symmetric cyclooctatetraene derivatives.
- Designer molecules to probe pi-pi interactions and hydrogen bonding networks.
- Organic molecules for energy storage, specifically in organic redox flow batteries.
- Photochemistry of highly conjugated acetylenic fluorophores.
- N-Heterocyclic carbene-transition metal complexes and their catalytic activity.

HONORS AND RECOGNITIONS

- 2021-present: **Chairperson, SERB-PAC** (Organic Chemistry)
- 2020-present: **Chairperson, Task Force on Empowerment and Equity Opportunities for Excellence in Science (EMEQ-SERB).**
- 2020 – **Elected Fellow** of the **Indian National Science Academy, New Delhi (FNA)**
- 2019 Elected as a **fellow** of the **Indian National Science Academy (FNA).**
- 2017 Elected as a **fellow** of the **Indian Academy of Sciences (FASc), Bangalore.**

To read more



RECENT PUBLICATIONS

1. A new 2,3-dimethoxy-1,4-naphthoquinone redox anolyte for non-aqueous organic static redox battery. P. Vallayil, K. Ramanujam, S. Sankararaman, *Electrochimica Acta.*, 2022, 407, 139889- 139899. IF 6.90.
2. Conducting and superhydrophobic hybrid 2D material from coronene and pyrene. J. S. Arya, M. K. Mahato, S. Sankararaman, E. Prasad, *J. Mat. Chem.C.*, 2021, 9, 10324-10333 IF 7.39
3. Which isomer is it, 1,2,5,6- or 1,4,5,8-tetrasubstituted cycloocta-1,3,5,7-tetraene? Synthesis of symmetrically tetrasubstituted cycloocta-1,3,5,7-tetraene derivatives. S. Gadigennavar, M. Ranganathan, S. Sankararaman, *Org. Biomol. Chem.*, 2020, 18, 9284-9291. IF 3.87.

For more details



BROAD AREA OF RESEARCH

His research focuses on **two aspects**, namely

1. **Chemistry of cyclooctatetraene (COT) derivatives**: The focus is on the valence isomerization of various COT derivatives.
2. **Organic molecules for redox flow batteries and static batteries**. The focus is on the identification and utilization of organic molecules as redox active materials electrolytes for application in redox flow batteries. Fabrication of prototype of such batteries is the aim of this project. On large scale these batteries are potentially useful in energy storage applications and supply to the grid.

CURRENT RESEARCH

1. **Redox couple of organic catholyte and anolyte**



“Storage of electrical energy is a contemporary problem in chemistry. We are contributing to this area by fabricating fully organic redox flow batteries. Our group is engaged in design, synthesis and application of organic molecules that can undergo electrochemical oxidation/reduction reactions in a highly reversible manner. This project is carried out in collaboration with Prof. R. Kothandaraman (electro chemistry expert). We expect to have a working proto type in the near future.”

Prof. S. Sankararaman

2. **Redox flow battery**

PLANS AHEAD

1. Continue to contribute to teaching Organic chemistry and spectroscopy courses to MSc students and Ph.D. scholars, basic Organic Chemistry course to BTech students.
2. Writing books on specific topics such as Stereochemistry, Aromaticity and Spectroscopy.
3. Bring out a new edition of the book on Pericyclic Reactions- A textbook.
4. Continue the ongoing research on organic redox flow batteries.

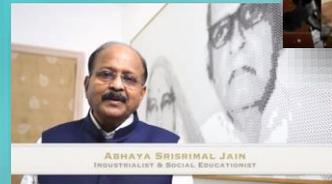
It is truly befitting that the Professor S. Sankararaman is invited to be the First occupant of K.K. Balasubramanian chair professorship at IIT Madras

ABOUT THE CHAIR LAUNCH:

The K. K. Balasubramanian Institute chair was launched virtually at 7.30 PM, September 4th, 2020.



CHERISHABLE MOMENTS



For the video of the Chair Launch



Thank you!

We would like to take this opportunity again to express our heartfelt gratitude to all those who made benevolent contributions towards the growth and development of IIT MADRAS



Indian Institute of Technology Madras, Chennai – 600036

www.iitm.ac.in

For more information, please contact:

Office of Alumni and Corporate Relations

T: +91-44-2257 8390 | acr.iitm.ac.in

Stay Connected:

