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*Promoting Catalytic
Science and Technologies*

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Catalysis Club of Philadelphia

Thursday September 17th, 2015

DoubleTree Hotel
4727 Concord Pike Wilmington, DE 19803

Catalysis – An Indispensable Tool

Sourav Sengupta

*DuPont Central Research and Development
Wilmington, DE*

Social Hour: 5:30 PM

Dinner: 6:30 PM

Meeting: 7:30 PM

Members: \$35.00

Walk Ins & Non-members: \$40.00

Student & Retired Members: \$20.00

*Menu**

Airline Breast of Chicken – with white wine sauce, lump crab imperial and baby vegetables;

Mushroom Stuffed Flank Steak – local Kennett Square Mushroom Medley roasted with goat cheese and herbs, rosemary whipped potatoes, sautéed green beans, and a sherry reduction;

Vegetable Lasagna;

**All dinners served with mixed greens salad, rolls and butter, chef's choice of desserts, coffee, tea, iced tea, decaf, and water.*

Meal reservations - Please notify your company representative or Alex Mironenko (alexmir@udel.edu) by **Thursday September 11th**, or register online:

[http://catalysisclubphilly.org/
program/meeting-registration/](http://catalysisclubphilly.org/program/meeting-registration/)

Membership - Dues for the 2015-16 season will be \$25.00 (\$5.00 for the local chapter and \$20.00 for the national club). Dues for students, post-docs and retirees will be \$10.00 (\$5.00 for local club and \$5.00 for national club).

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Abstract — In the past three decades, there has been a concerted effort in the chemical, agrochemical, pharmaceutical, nutraceutical, and petroleum industries to design cost-advantaged, inherently safer, sustainable, and environmentally-friendly processes. Catalysis plays a crucial role in improving process efficiencies and process intensification leading to increased atom utilization, reduced by-product formation, cheaper process, and lower capital investment. Also, there is an increasing interest in using renewably-sourced feedstocks for the production of fuels, chemicals, and advanced materials due to fluctuations in petroleum prices, limited availability of petroleum resources, and increasing consumer consciousness about sustainable processes.

Although catalysis is a major *tour-de-force* in driving this efficacious and green chemistry revolution, the role of reaction engineering, reactor design, process development, and optimum operating conditions cannot be underestimated. Some of the fundamental concepts of catalysis will be discussed and linked to chemical processes of industrial relevance. Specifically, the role of science and engineering in industrial catalysis will be illustrated with particular emphasis on catalyst evaluation, process optimization, catalyst deactivation, and reactor design associated with industrial processes. Case studies will include hydrogenation reactions using supported base metal and precious metal catalysts and solid acid catalyzed reactions, including the hydrogenation of hexafluoroacetone and catmint oil, and dehydration of xylose.

Biography — Dr. Sourav K. Sengupta is a Research Fellow in the Molecular Sciences Division (Central Research & Development Department) of E. I. DuPont de Nemours & Co. He received his PhD degree in Chemical Engineering from the University of Delaware in 1991. Immediately after completing his PhD, Dr. Sengupta joined the DuPont Company and was placed on loan to Conoco where he developed novel pathways for the oxidative desulfurization of gasoline and qualified new hydrodesulfurization and FCC catalysts. Shortly afterwards, he was transferred to the Corporate Catalysis Center (CR&D). At CR&D, he worked on solid acid, solid base, and hydrogenation catalysis programs and made important contributions to a number of Strategic Business Unit (SBUs).

Dr. Sengupta spent several years at DuPont's Nylon business unit, where he worked on a number of commercial processes and research programs, including low-pressure and high-pressure ADN hydrogenation, hydrogen cyanide synthesis by Andrussov and induction-heating processes, and nitrous oxide destruction catalyst technology.

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When DuPont sold their Nylon, polyester, and Lycra businesses to Koch Industries, Dr. Sengupta joined Invista, a wholly-owned subsidiary of Koch Industries, where his work involved investigating the technical and economic feasibility of caprolactam commercialization.

After a short stint at Invista, Dr. Sengupta came back to DuPont, and joined their Chemical Solutions Enterprise (DCSE) as a manufacturing technical chemist at Chambers Works in New Jersey. His responsibility covered 42 different specialty chemicals. There he worked with a team of experts to design, develop, and commercialize a novel hydrogenation process for the production of hexafluoroisopropanol (HFIP) and hexafluoroacetone (HFA) recovery process. He was also involved in the commercialization of a number of Capstone products. In 2009, he started up a Process Development Center for DCSE at the Experimental Station. In 2011, he moved back to CR&D and has been working on a number of R&D programs on using renewable feedstock to manufacture chemicals and materials and new catalyst development.

Dr. Sengupta's expertise is in the area of catalysis, reaction engineering and reactor analysis, and process development. He has over 65 US patents, publications, and presentations to his credit.

