Professor Ganapati D. Yadav: Versatility and Humility Is Thy Name

ASCENT

Ganapati D. Yadav, known to family and close friends as Yogesh, is an exceptional, multifaceted, and versatile academician who has carved a place for himself as one of the preeminent engineering scientists in India. Many adjectives come to our minds when one thinks of Yogesh—cheerful, modest, committed, passionate, daring, pragmatic, ingenious, intuitive, and never-say-die philosopher. He ranks as one of India’s finest university leaders. His stewardship of his alma mater—his karma bhumi, a reverent Sanskrit word for one’s place of work—the Institute of Chemical Technology (ICT) bears a torch for others in his homeland and overseas. He is self-less, inspiring, and untiring. Over the years, he has rendered yeoman services to the chemical sciences and engineering profession, the chemical and allied industry, and the government of India in various capacities. His unbelievable ability to raise funds for his alma mater and education, research, welfare, and professional bodies such as the Indian Institute of Chemical Engineers (IIChE), the Catalysis Society of India, and Maharashtra Academy of Sciences have been instrumental in revitalizing these institutions. Uniquely, he is also the brains behind the creation of a unique museum, called the Dhirubhai Ambani Hall of Fame, at the ICT, which showcases and promotes the achievements of the chemical sciences and industry in India and around the globe. We are truly honored to be able to call him Yogesh, one of the names of Indian deity Lord Krishna!

DAILY ROUTINE

If you have received an E-mail from him in the early hours of the morning much before the dawn, do not be astonished! We have not understood when he takes rest (or if he does) since his day begins at 4:00 am with exercise, followed by serious studies and research, and paper writing. Much of Mumbai—which is a city that surpasses New York for its commotion and hubbub—is still asleep by the time he has completed his daily writing. Yet, despite being the Vice-Chancellor of one of India’s best universities (a position that is equivalent to President in the U.S. collegiate system), he still finds time to do active research and write papers! He travels around the planet to bolster the research and education enterprise of his institute, yet his research and administrative duties are never neglected. He is one of the finest practitioners of e-governance that we have known.

FORMATIVE YEARS

Born on September 14, 1952 in a peasant’s family in the small village of Arjunwada in the Kolhapur district of Maharashtra State, Yogesh has secured his current stature through intelligence, creativity, hard work and self-belief. He is officially named Ganapati because of the coincidence of his birth on Ganesh Chaturthi, which is a very important religious festival in India. He very proudly states that all important decisions in his life were taken by himself, though only after receiving the blessings of his parents. He truly worships his parents, since it was they who saw a spark in him at a very young age and encouraged him to chart new paths with the sole condition that he would share his joys, sorrows, triumphs, and adversities with them, no matter where his journey took him. This journey has seen him create a unique place for Indian chemical engineering on the global scene and has sustained the glamor of this marvelous profession in an impoverished country such as India. Having been associated with him in various capacities over the

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years, we have been fortunate to witness his personal and professional ascent.

- SCHOOLING

He was educated up to seventh standard (equivalent to “grade” in the American education system) in the primary school at his village of ~1400 people, which had an inadequate number of teachers and no school building. His teachers made use of village temples as classrooms, with intermittent in flow of devotees interrupting classes with their walkthroughs. By the time he entered the seventh standard, there were only five teachers and a building with three classrooms. Thus, he had the pleasure of studying in the same classroom with his elder brother, who was in a higher standard! A single teacher would teach two classes at the same time and ask students from one class to not pay attention to the subject that was meant for the other class. Therefore, he was lucky to receive lessons of a higher standard free! After the seventh standard or vernacular final examination in Marathi—his score was the highest in the district—he enrolled in Swami Vivekanand High School, which is again a high school having somebody’s old home as the building at Shelewadi, a neighboring village some 5 km away; he made the journey to and from school each day on his bare feet. When he was in the ninth standard, one of his high school teachers, Mr. Bal Gangatirkar, suggested to his parents that Yogesh needed to be in the company of real scholars, and not in a rural school that lacked the teachers and facilities necessary for a good education. The decision to send Yogesh to Kolhapur City was rather quick and our dear friend Yogesh left his home at the tender age of 14 to continue his studies at the elite Private High School (quizzically named, because it is a public school). He once again remained the top-performing student and his versatility was evident in art, poetry, debates and elocution competitions, and sports. Like most villagers, Yogesh also is an avid athlete. Yet, cricket, which is a quasi-religion in India, did not appeal to him. Cricket, being an expensive game, had not yet pervaded the village life then. Indian wrestling, volleyball, and track and field’s high jump event, in addition to kabbadi and khokho (the latter two are traditional Indian sports), were his true loves. He was again the top performer in the school and among the top 60 students in the entire state; he had the honor of receiving several scholarships and a Government of India merit scholarship for higher studies. He once again remained the top-performing student and his versatility was evident in art, poetry, debates and elocution competitions, and sports. Like most villagers, Yogesh also is an avid athlete. Yet, cricket, which is a quasi-religion in India, did not appeal to him. Cricket, being an expensive game, had not yet pervaded the village life then. 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life for the sake of ICT. Such is his devotion.” He says that he has witnessed MM Sharma’s spectacular rise, his encyclopedic knowledge of a variety of subjects, his method of handling research and administration, and, above all, his fairness to one and all from the closest quarters imaginable, and these lessons have benefitted him immensely throughout his career. His leadership has been seen right from his student days. During the long strike by the employees of the University of Mumbai in 1977–78, he organized student volunteers to run the institute including working the library, maintaining the water supply, watering the garden, cleaning classrooms and laboratories, and helping the University administration immensely. The then-Director Professor E. H. Daruwalla appreciated his leadership qualities and gave him a letter stating that he was authorized to do so. It is a fortuitous coincidence that, later, in 2009, he took over as the Director and R.T. Mody Professor of Chemical Technology; the Institute Professor’s position, which was created for the Head, which had been lying vacant since 1971 because Daruwalla had not accepted it, for some strange reasons. After the ICT was converted to a Deemed University on September 12, 2008, the Director’s position was converted to that of Vice Chancellor (equal to President in the North American collegiate system) and R.T. Mody Distinguished Professor. Meanwhile, Yogesh also had a one-year appointment as Headillia Chemicals—UDCT Diamond Jubilee Fellow during 1995-96 and was appointed to the newly created Chair, Darbbari Seth Professor of Inorganic Chemical Technology in October 1996. Mr. Darbbari Seth, Chairman and Managing Director of Tata Chemicals, was a doyen of inorganic chemical industry and his well-wishers had donated funds to honor him and, once again, Professor MM Sharma was entirely instrumental for it. After becoming the Vice Chancellor, Yogesh sought additional funds of INR 35 million in 2013 to support this position, which is now renamed as Tata Chemicals Darbbari Seth Distinguished Professor of Chemical Engineering.

**DOCTORAL RESEARCH**

Under the supervision of MM Sharma, he conducted his doctoral research dealing with studies in heterogeneous reactions, particularly gas absorption with chemical reaction and phase transfer catalysis (PTC). Sharma had a penchant for problems having deep origins in chemistry, and he asked Yogesh to survey literature under a seminar topic on the emerging area of PTC during 1975. He wrote a very critical review paper with suggestions on a number of research problems. It was published in the journal *Chemical Industry Developments* in 1975 and became much sought after the article was cited in books and monographs of famous authors such as Starks and Liotta, Dehmlow, and others. It covered speculative reactions, one of them being solid–liquid (S-L) PTC of isocyanates; quite surprisingly, it was reported as a Japanese patent in 1977. He has continued to work on PTC and is one of the foremost authors on a variety of multiphasic PTC reactions and mathematical models. A model stirred contactor with two independent stirrers was used to study the effect of diffusivity on true gas-side mass-transfer coefficients in that contactor with a planar interface (*Chemical Engineering Science*, 1979, Volume 34, pages 1423–1424) and it found its place in *Perry’s Handbook*. Absorption of chlorine in aqueous solutions of phenols and aromatic sulfonic acids was another industrially relevant subject that was studied elegantly (*Chemical Engineering Science*, 1981, Volume 39, pages 599–608). He proposed a new mechanism of S-L PTC and studied the synthesis of benzyl esters (*Industrial & Engineering Chemistry Process Design and Development*, 1981, Volume 20, pages 385–390). This research was commercialized and used by a few industries. His theoretical work on gas absorption with instantaneous reaction, followed by desorption of the intermediate gas, was also acclaimed. Thus, the absorption of chlorine in aqueous solutions of sodium hydroxide was studied in the model stirred contactor, wherein desorption of hypochlorous acid is followed by its dissociation to chlorine monoxide (*Chemical Engineering Science*, 1983, Volume 38, pages 1119–1133). One U.S. company has used this work for their production of epichlorohydrin and has mentioned it in their patents. Although some of his doctoral work was patentable, it was not fashionable during those days and Yadav and Sharma were more than happy to share his results with one of the industries. A joy of seeing his work becoming commercialized was more than any other monetary reward. Things have changed since then, and now he has 69 patents (filed and awarded).

He served as Associate Lecturer in Chemical Engineering (1976–1980), dealing with the chemical engineering laboratory and, particularly, the demonstration experiments. Sharma was a great motivator in this regard, and many of the experiments were designed by Yogesh. A monograph on “Demonstration Experiments in Chemical Engineering”, coauthored with Panagkar and Niranjan, was published in 1982 by the Chemical Engineering Education Development Centre, Indian Institute of Technology, Madras, India. Since then, demonstration experiments have become a routine part of the Chemical Engineering curriculum in ICT and over 70 experiments are arranged every year for the benefit of the students. He went to Loughborough University, in the United Kingdom, as Leverhulme Overseas Visiting Fellow (1980–1981) and worked on oil blob mechanics in porous media with G. Mason and on binary chromatography with B. A. Buffett and published seminal papers. He returned to India, worked briefly on a sponsored project by Bombay Oil Industries in 1982, and then joined the group of F. A. L. Dullien at University of Waterloo (1982–1986) and worked with John Chatzis and Ian Macdonald. Indeed, during his initial stages, he was supported by Donald Scott and Park Reilly. He made significant fundamental contributions to new methods of enhanced oil recovery, multiphase flow in porous media, flow visualization, network modeling and percolation processes. At the University of Waterloo, he also had association with Donald Scott on modeling the flash pyrolysis of biomass to produce bio-ols. He was very actively involved in the affairs of the Indo-Canada Association in the Kitchener, Waterloo area, which was comprised of ~150 families. Now, he has returned to the area with significant research on biorefinery and the conversion of biomass to value-added chemicals.

**JOINING UNIVERSITY OF MUMBAI AGAIN**

During his visit to Waterloo in 1984, MM Sharma advised Yogesh to return to India whenever there would be a vacancy of a faculty position in UDCT Mumbai, and Yogesh did just that in 1986. The selection committee recommended him for a higher salary, which the university could not give without the permission of the State Government; thus, Mr. Kishore Mariwala offered him a job as a consultant to Bombay Oil Industries, with which he was associated for 5 years. After 3 months of waiting, he joined the UDCT Mumbai as a Reader...
(somewhat equivalent to the position of Associate Professor in the U.S. collegiate system) on October 22, 1986. Mariwala has been a great friend and admirer ever since. After joining the UDCT, MM Sharma provided him with another opportunity in 1987 to work full time for 2 months as a summer industrial consultant with Polyolefins Industries, Ltd. (PIL). The involvement was so great that he continued with them as a consultant on a retainer basis for next 7 years, dealing with rubber chemicals. It was a great period of learning and practicing for Yogesh. He has been actively performing industrial consultation ever since for a variety of industries located in Mumbai, Vapi, Ankleshwar, Hyderabad, and Delhi.

■ THEME OF RESEARCH

After returning to India, he wrote five proposals to various agencies which funded them. The initial work on pore structure analysis was supported by Department of Science and Technology (DST), followed by new methods of enhanced oil recovery supported by ONGC with additional funding from MHRD, AICTE, and CSIR. He was supported by Professor M. A. Nabar, Head of Chemistry Department of Bombay University, who recognized his interest in chemistry and permitted him to guide research at doctoral level in Chemistry. Upon the untimely death of R. A. Rajadhyaksha, several of his students joined Yogesh’s group. He had to build all of the facilities in petroleum engineering from scratch and develop micromodels for flow through porous media. Thus, Sagar Trailokya, K. C. Narayan, Pramod Kumbhar, Manoj Kharkar, Vijay Yadav, Ashok Dixit, Bhagyashri Dixit, K. N. Subramanian, Shripad Gumaste, N. Kirthivasan, M. S. Krishnan, Tushar Thorat, and Suguna Naik had the pleasure of participating in laboratory buildup. They all are holding senior positions in industry now. His research activities thus shifted to sulfated zirconia, acidic clays, ion exchange resins, heteropoly acids, modified metal oxides, zeolites, and coal. Over the past 40 years, he has made innovative and original contributions, both by theory and experiment, to catalytic science and engineering, green chemistry and technology, chemical engineering, biotechnology, and energy engineering. He was the first to propound the practice of green chemistry and engineering in India, including education and research, and has developed pollution-free technologies, which have been internationally patented; some are practiced in industry. He has provided breakthroughs in design, synthesis, and industrial applications of novel catalytic materials. All work has been carried out in India since 1986. Over the years, he has crafted a distinct theme on science and engineering of pores, (nano)particles, and interfaces, with or without functionalization, in search of clean and green processes where he has elegantly used the fundamentals from different disciplines ranging from chemical engineering, chemistry, catalysis, materials, energy, and biotechnology. Thus, on one hand, he dealt with novel methods of oil recovery from depleted reservoirs to the design and development of new catalysts by manipulating pores and networks, and superimposition of catalytic centers with controlled accessibility or by creation of multiple interfaces to increase yield and selectivity of the desired product in a complex reaction network. Thus, his work has resulted in exceptional research productivity, bolstered with international recognitions, awards, honors, and prestigious fellowships.

■ RESEARCH PROFILE IN INDIA

After returning to India as Reader in Chemical Engineering at the UDCT in October 1986, he continued to work in oil recovery methods with support from the Oil and Natural Gas Corporation (ONGC), which has been patented and also studied coal structure and gasification, fractals and catalysis. He also started consulting with renowned chemical industries. He received a large number of research grants and has maintained a very active research group since 1990.

■ PIONEERING THEORY AND EXPERIMENTS

He published the pioneering theoretical and experimental proof of the celebrated phenomenon of inversion in rates and selectivity in Friedel–Crafts reactions, which was debated in the literature of leading organic chemists (e.g., in the journal Tetrahedron Letters, in both 1993 and 1995). This work has proved the genesis of inversion in reactivities is due to preferential adsorption and that clays are not microrobots, as was claimed previously. A theoretical model was validated using several solid acids. He has introduced new concepts in PTC and his research on tri-liquid PTC, the role of the omega phase, and cascade-engineered PTC is seminal (see work in the following journals: Langmuir in 2002, Industrial & Engineering Chemistry Research in 1998, Catalysis Today in 2000, and Journal of Molecular Catalysis A in 2003). He also happens to be the one of most productive researchers in the field of PTC. He has also contributed to the basic work on the role of microwave irradiation in catalysis including mathematical modeling (Journal of Molecular Catalysis A, in 2005). The role of enzymes in conjunction with microwaves has been exploited for the separation of chiral pharmaceutical compounds in over 40 papers during the period of 2002–2014.

■ SCIENCE AND ENGINEERING ACCOLADES

Many of his papers deal with the intertwining of chemistry, chemical engineering, and materials technology. The journal Green Chemistry (RSC, U.K.) had listed his paper that was published in 2000 as one of the most influential papers in 2002 and 2004. Now, he has been appointed as a member of the Editorial Board of this high-impact-factor journal. He was found to be the topmost scientist in India in the field of catalysis, based on the SCI database and peer-reviewed papers in 2008. He was the only engineer to have ranked in the top 20 scientists of India as a highly productive and cited scientist with a variety of contributions to research, in a survey conducted by CSIR in 2008 and also by DST for their PURSE program. The hallmark of his research is its fundamental analysis with a focus on industrial adoption and commercialization. Some of his work has found extensive use in many of India’s chemical manufacturing corporations. He has remained, over the years, an active consultant to several industries, and his advice has been successfully commercialized.

■ NOVEL FUNCTIONALIZED MATERIALS AND MULTIPLE INTERFACES

His laboratory has reported a series of novel mesoporous solid superacids called UDCaTs, MUCaTs, and ICAcTs, leading to 47 patents. He has devised elegant selectivity engineering principles in multiphase reactions using inert nanoparticles, new solid superacidic catalysts, multiple liquid phases such as tri-liquid PTC. He also developed novel redox materials, UDCaT-3 (published in the journal Advanced Synthesis &
Chemistry Research, 2008) and silver- and platinum-based OMS-2 and Fe-
TiO$_2$ materials, and he holds several patents and has written
many papers. His group was the first to synthesize a solid
superacid called UDCaT-5, which has a stronger acidity than
the hitherto known sulfated zirconia (Journal of Catalysis, 2004)
which was further improved as an FLSZ catalyst (Journal of Catalysis,
2012). Novel base catalysts have been synthesized
and patented, and the work has appeared in periodicals such as
Catalysis Today (2013), Journal of Molecular Catalysis A:
Chemical (2012), and Chemical Engineering Journal (2013). The
synergism of heteropoly acids and their modified versions has
been propagated by his group in many industrially relevant
reactions. The synergism of heteropoly acids and their modified
versions and clays as nanocatalysts was reported for the
first time in his leading paper in 1995 in the journal Chemical
Communications, which is often cited. A large number of papers
have been emanated in this area.

■ NOVELTY OF PHASE TRANSFER CATALYSIS

His pioneering work in tri-liquid PTC has several dimensions;
thory, practice, and modeling using population balances (see,
for example, the works cited in the following journals: Chemical
Engineering Journal, 2012; Applied Catalysis, 2012; Chemical
Engineering Research and Design, 2012; and AIChE Journal,
2012). A new reactor was designed to study tri-liquid PTC. A
novel concept of pseudo-PTC has been proposed (Organic
Process Research & Development, 2012). He has also contributed
to the basic work on role of microwave irradiation in catalysis
including mathematical modeling.

■ WASTE MINIMIZATION AND RENEWABLE
RESOURCES

The practical applications of Yogesh’s research range from
pharmaceutical to perfumery chemicals as a green concept with
waste minimization. Indeed, this has now been taken to the
design and development of a novel microchannel reactor. The
use of octahedral molecular sieves as base materials in
developing novel monometallic and bimetallic catalysts have
been pursued elegantly (see the periodicals Chemical Engineer-
ing Journal, 2012; and ChemCatChem, 2013). Bioglycerol as a
renewable source has been valorized using novel catalysts and
has been covered in a series of patents and also published (see
works in the following noted periodicals: Industrial &
Engineering Chemistry Research, 2012, 2013; Clean Technolo-
gies and Environmental Policy, 2012; Catalysis: Science and
Technology, 2013). Novel catalysts based on polyurea have
also been developed and used under supercritical conditions
(Journal of Supercritical Fluids, 2011; Industrial & Engineering
Chemistry Research, 2013).

■ BIOCATALYSIS AND PHARMAceUTICALS

Another attribute of his work in last 5 years is the separation of
chiral pharmaceutical compounds using enzymes in non-
aqueous media and microwave irradiation, which has resulted
into important papers recently in such journals as Process
Biochemistry, Applied Biochemistry and Biotechnology, Journal of
Molecular Catalysis B: Enzymatic, Bioresource Technology,
Biomedical Research International, Biochemical Engineering
Journal, Industrial & Engineering Chemistry Research, Interna-
tional Journal of Chemical Reactor Engineering, Chemical
Engineering Research and Design, and Chemical Engineering
Science, which are all high-impact-factor journals.

■ ENERGY ENGINEERING

In the field of energy engineering, a novel hydrogen production
technology has been developed based on experiments since
2008, and it has resulted into three patents; pilot-scale
experiments are underway with the sponsorship of ONGC.
Currently work is also in progress on hydrogen storage and
heat storage media with ONGC.

■ INTERNATIONAL COLLABORATIONS

His interactions with international researchers have been
interesting and in different areas of research: Hui Wang and
Ajay Dalai (Saskatchewan, Canada); Janos Kozinski (York);
Flora Ng and Gary Rempel (Waterloo, Canada); Sarbajit
Banerjee (SUNY, Buffalo, NY, USA, and Texas A&M
University, College Station, TX, USA); Riitta Kiski (Oulu,
Finland); M. Keller, B. Luecke, and K. Narayana (Leibnitz
Institute of Catalysis (LIKAT), Rostock, Germany); Inmaculada
Ortiz, Raquel Ibáñez, and Angel Irabien (Universidad de
Cantabria, Spain); Suresh K. Bhargava (RMIT University,
Australia); Kenichi Komura (Gifu University, Japan), along
with M. Lakshmi Kantam (IICT, Hyderabad, India); Phil
Coates and Anant Paradkar (Bradford, U.K.); D. Ramkrishna
and Arvind Varma (Purdue University, West Lafayette, IN,
USA); Bala Subramaniam (Kansas University, Lawrence, KS,
USA); Gloria Berlier (Torino, Italy); Yeol Sasson (Casali
Institute, The Hebrew University, Israel); and Dennis Miller
and J. J. Jackson (Michigan State University, East Lansing,
MI, USA).

■ PRODUCTIVITY

He has published over 300 international publications in 67
high-impact-factor international journals; of these journals, 226
have an impact factor greater than 3. He has also authored/co-
authored 2 books (1 in preparation) and holds 69
international patents. His work on sulfated zirconia, heteropoly
acids, clays, and ion-exchange resins is exceptionally well-
recognized and has been cited in over 6500 papers of
international repute, including the following: ACS Sustainable
Chemistry & Engineering, Advanced Synthesis and Catalysis,
AIChE Journal, Applied Catalysis A: General, Applied Catalysis B:
Environmental, Applied Biochemistry and Biotechnology, Applied
Clay Science, Biochemical Engineering Journal, Biomed Research
International, Bioresource Technology, Biotechnology Progress,
Canadian Journal of Chemical Engineering, Catalysis Surveys
from Asia, Catalysis Communications, Catalysis Letters, Catalysis
Science Technology, Catalysis Today, Chemical Communications,
Chemical Engineering Journal, Chemical Engineering Research &
Design, Chemical Engineering Science, ChemCatChem, Chemos-
phere, Chimica & Industria, Chimica Oggi, Chirality, Clean
Technology and Environmental Policy, Computational Biology and
Chemistry, Current Catalysis, Current Science, Enzyme and
Microbial Technology, Faraday Transactions, Green Chemistry,
Indian Chemical Engineer, Industrial & Engineering Chemistry
Research, Industrial & Engineering Chemistry Process Design and
Development, International Journal of Chemical Reactor Engineer-
ing, International Reviews in Chemical Engineering, Journal of
Environmental Management, Journal of Fluorine Chemistry,
Journal of the American Oil Chemists’ Society, Journal of Catalysis,
Journal of Chemical Technology and Biotechnology, Journal of
Chemical Thermodynamics, Journal of Colloid and Interface
(Oxford), Journal of Molecular Catalysis A: Chemical, Journal of


The h index of his publications now stands at 42, which is truly outstanding for an engineer/scientist. The i10 index is 152. He has guided 76 Ph.D. thesis candidates (Chemical Engineering/Technology, Biotechnology & Chemistry) and 80 Master’s thesis candidates, as a single guide. Currently, he is supervising a group of 39 graduate students, project scientists, and post docs on a spectrum of topics.

■ ROLE AS A LEADER

After his appointment as Vice Chancellor and R.T. Mody Distinguished Professor, he has worked assiduously to raise the bar. He encouraged and got all departments in ICT supported by UGC’s special assistance (SAP) program with over 100 Ph.D. fellowships per annum, and many of the Departments have received funds for infrastructure, in the range of 5–8 million rupees and the DST FIST support for the majority of them. The Chemical Engineering Department also received the unique honor of UGC National Resource Networking Centre with funding of 100 million rupees. So, the Centers of Advanced Studies have been established in Pharmaceutical Sciences and Technology, Food Engineering and Technology, and Green Technology. His leadership has seen phenomenal growth of the ICT, which is rated as the best in chemical sciences and engineering and is ranked among the top five in the world with several awards, such as CHEMTECH Foundation’s Best R&D Institute, Number 1 rank in Chemical Engineering in India, and No. 4 in the World in Research Publications.

The most important contribution that he made to the ICT was getting the Maharashtra Government’s Elite Institute Status and Centre of Excellence, like IITs, IISc, IISERs, which was announced in the State Assembly. It is an extraordinarily unique distinction for any institute in India that has grown from a University Department to Deemed University to an elite institute like IITs. The State Government will soon allot additional satellite campus. ICT also was declared as the Numero Uno TEQIP funded institute among 127 during Phase 1 and the Lead Institute in Phase II. The Tata Chemicals AICTE-CII Best Industry Linked Institute Award in Chemical Engineering was bestowed twice in a row for 2012 and 2013 among all institutes in India. ICT, with a campus of only 16 acres, houses modern laboratories with 710 doctorates, 450 Master’s students, and 1100 undergraduate students. It is recognized as a model for industry–institute collaboration. Several prestigious universities from the United States, the United Kingdom, Australia, France, Canada, and New Zealand, as well as leading industries from across the globe and from India, have signed MOUs with the ICT to promote technological research and development. He has been responsible for getting munificent donations for the ICT for faculty endowments, student and nonteaching staff support, and infrastructure, and the Institute now has a modern ambiance and facilities on par with the best in India and abroad. The Bill and Melinda Gates Foundation has awarded four projects of $100K US during the last two years, and the DBT-ICT Centre for Energy Sciences, headed by Professor Arvind Lali, is making waves, because of the development of industrially relevant technologies. Yogesh is extremely proud of his colleagues, students, support staff, and alumni for their contributions to the institute. He states that his job is to encourage his colleagues and students to be individual centers of excellence in their areas of specialization, so that the institute grows rapidly. The UGC has recognized ICT for its uniqueness by granting 12 faculty positions. Many of the students and faculty have won prestigious awards and accolades. He has been championing the cause of the UDCT Alumni Association, which has been a great source of support. He had been interacting with hostel students from 1991 to 2008 as Warden and also Head Warden, having introduced several facilities.

■ ACCOLADES

He has received numerous honors and distinctions for his innovative contributions to green chemistry and engineering, catalysis science and engineering, chemical reaction engineering, biotechnology, nanotechnology, and energy engineering. He is a Fellow of the Indian National Science Academy (INSA) and the National Academy of Sciences, India (NASI), among others. He has been honored by the Government of India’s Department of Science and Technology with its prestigious Jagdish Chandra Bose National Fellowship and is currently the only active university faculty member in the state of Maharashtra to be elected as Fellow of The World Academy of Sciences (TWAS) in Trieste, Italy. He was bestowed with the D. M. Trivedi Lifetime Achievement Award of Indian Chemical Council (formerly ICMA) (2013), Indian Chemistry Council (2014), and the Dr. B. P. Godrej Lifetime Achievement Award of the Indian Institute of Chemical Engineers (IICheE) (2013). The Indian Specialty Chemical Manufacturers Association (ISCMA) and PSN College of Engineering TN have bestowed upon him the Best Researcher Awards for 2012. Other notable international recognitions bestowed upon him include the Fellowships of The Royal Society of Chemistry (RSC), U.K., and The Institution of Chemical Engineers (IChemE), U.K.; the Canadian Catalysis Foundation’s Cross-Canada Lectureship Award; the University of Amsterdam’s John van Geuns Lectureship; the Park Reilly Distinguished Speake rship of the University of Waterloo; the Johansen Crosby Visiting Professorship in Chemical Engineering at Michigan State University; the Distinguished Asian Visiting Scholar at Purdue University; Visiting Professorship at the Loughwa University of Science and Technology, Taiwan; and Adjunct Professorship at the Royal Melbourne Institute of Technology and University of Saskatchewan, Canada. He is elected Chairman of APCAT-7, the Asia Pacific Conference on Catalysis, and is also on the Governing Council of APCAT, the confederation of catalysis societies from Asia Pacific region. He is a member of the International Advisory Board, The State Key Laboratory for Catalysis, Dalain Institute of Chemical Physics, and The Chinese Academy of Sciences.

In India, Yogesh has been awarded with prestigious honors, such as IIT-Roorkee’s Khosla National Award; RPG Life Sciences’ Padma Vibhushan Prof. MM Sharma Medal and Chemcon Distinguished Speaker Award of IICheE; Institution of Engineer’s Eminent Engineer Award; Ashland Padma Vibhushan Prof. CNR Rao Medal & Chemcon Distinguished Speaker Award; Best Teacher Award of the Government of
CONTRIBUTIONS TO DEVELOPMENT OF PROFESSION

His contributions to the development of the Chemical Engineering profession in India are incomparable. During his tenure as President of the IIChE in 2001, he reinvigorated the body by incorporating 51 national awards through endowments. These awards have been named after some of the best chemical engineers, technologists, and chemists, such as C. N. R. Rao, MM Sharma, L. K. Doraismwamy, R. A. Mashelkar, G. S. Laddha, R. Kumar, K. Venlaraman, B. D. Tilak, B. P. Godrej, A. V. Rama Rao, G. S. Sidhu, N. Nayanauama, and G. P. Kane. CSIR laboratories such as CSCMRI, NCL, IICT, NEERI, and CLRI have also helped him to establish awards in their names. Ambuja Cement created 10 awards for Ph.D. students, and many more. This has rejuvenated the IIChE tremendously. He has the unique distinction of being Chairman of the National Organizing Committee of the Indian Institute of Chemical Engineers Annual Congress called CHEMCON on six occasions.

He also has served as Director of the Asia-Pacific Confederation of Chemicals Engineering Institutes. He has also been a member or chaired several national and international committees of GOI ministries and autonomous bodies such as MHRD, DST, DBT, UGC, AICTE, CSIR, FICCI, CII, the PSA’s on Green Chemistry, the Planning Commission’s Pan India S&T Committee, and the Government of Maharashtra’s Rajiv Gandhi S&T Commission Peers Group, Maharashtra State Innovation Council. He was also the member of the DST’s Special Peer Review Committee for Evaluation of Reports on the Bhopal Gas Disaster, and has led two delegations of Indian scientists to South Korea and Germany. He is Chairman, Research Council, CSIR-CSCMRI, and member of RC of IICT, Hyderabad and NIIST, Trivandrum. He also serves as Chairman, Advisory Council of DST-National Centre for Catalysis Research, IIT-Madras. He is a member of Maharashtra Innovation Council and has chaired the Expert Committee to prepare a report on “Analysis of Vacancies in Professional Courses and Remedial Action Plan in 2014”. He is also a member of UGC’s Steering Committee on Universities with Potential for Excellence. He has developed a museum and hall of fame, with the support of Reliance Industries, on “Chemical Sciences and Engineering and Its Impact on Modern Society”.

As a Vice Chancellor, he has the distinction of having the great R. A. Mashelkar as the Chancellor, who has tremendous faith in his capabilities as a leader and scientist. Yogesh attributes his success to Mashelkar’s mentorship and trust. His devotion to the ICT is beyond words. He spent over a year in getting the footpaths of ICT cleared of slums and unauthorized structures and squatters. He took the initiative in beautifying the locality through the participation of industries and residents. The entire campus has been metamorphosed. Many beautiful thought-provoking posters are displayed to encourage students and visitors. He has been a dreamer and believes that the ICT should become a central university or institute of national importance with funding like IITs. The ICT has been metamorphosed in terms of renovation and development of laboratories and offices. His own office is fully transparent. He has many plans for the Institute, including additional satellite campus.

Yogesh is also a vociferous advocate of the chemical sciences and industry in print and on radio and television. He has been championing the rejuvenation of the chemical industry through adoption of sustainable clean and pollution-free technologies. He has traversed the world to give over 450 lectures, including prestigious award lectures, keynote addresses, and plenary lectures.

FAMILY LIFE

When he left his home at the age of 15, his parents had a simple message for him:

“You will be on your own and you have to fight all your life’s battles on your own. We will not be there any time with you but our blessings will always chase you. So follow the path of truth and maintain your character. Include us in your happiness and sorrow.”

So when he chose his life partner, Vasanti, who is also an alumnus of the ICT, contrary to what his friends and others believed, his parents were the happiest lot. On the family front, he has been a very proud husband and father. All members of his family are chemical engineers and doctorates and the newest member, his daughter-in-law, is an architect. His wife, Vasanti, has a Ph.D. in Chemical Technology and has her own business. Throughout his life, Yogesh has been extremely hard-working and Vasanti has been extremely understanding; the proverbial saying, “Behind every successful man there is a woman”, proves that her support has been very vital in all of his professional activities. The other lady who influenced him was his mother. Vasanti has been a great motivator to their sons. His sons Vikramaditya and Gautam are both chemical engineers. Vikramaditya is a graduate of Waterloo University, with a Ph.D. in Chemical Engineering from MIT and a postdoc from Harvard. He is now an Assistant Professor in the Department of Chemical and Biological Engineering at University of British Columbia, Vancouver, Canada. His wife, Manali, is an architect. Gautam studied at the University of Western Ontario, Canada, and holds a Ph.D. from Purdue; he is now a postdoc at City College University of New York. Yogesh is extremely proud that his family members have allowed him to work assiduously and provided him immense joy.

He is greatly influenced by Swami Vivekananda and Vedic literature and is a poet. He has written a very melodious university song for the ICT and frequently quotes from literature. Success is autocatalytic and failure is temporary in his philosophy. One of the posters, titled “Reach the Stars”, aptly describes this versatile innovator.
The Rich. The Poor. The Marginal. The Privileged. The Underprivileged. They studied here. They studied here. They made it big. Do not ask how to do it. Do it. Underestimate NOT, who you could be. Think Big. Dream Big. Do not dismiss your dreams. To be without dreams is to be without hope; to be without hope is to be without purpose.

So, dear readers, you now realize why we are delighted and privileged to present this Festschrift in honor of our long-standing friend and fantastic person, whose life’s mission has been to serve the profession with complete sincerity and honesty, overcoming all hurdles and hurricanes. Now you realize how a person with a rural background can succeed against all odds. He attributes his entire success to great persons who changed the course of his life: the teachers and students who worked with him, even though he was nobody. He modestly says that he has been singularly lucky in his life. He successfully completed five years as the Vice Chancellor recently and it is the desire of his professional friends, students, and colleagues to dedicate this Festschrift of Industrial & Engineering Chemistry Research, wherein he has published more than 30 articles so far. We thank all the contributors, and especially Professor Donald Paul and Professor Philip E. Savage, for providing us the opportunity to organize this special issue. We acknowledge excellent input given by Vikramaditya and thank Yogesh for being so candid about his formative life and career with interesting personal matters, which many may put beyond the public eye. We would like him to grow in strength and continue to guide the destiny of the ICT with his enthusiasm and untiring efforts and also in the interest of our profession. He has been fond of quoting Sanskrit in many of his extempore talks and regales poetry. We would like to quote a Vedic verse which has been rehearsed on important milestones for seeking blessings for the honoree.

He is a swayambhu—a self-made man—and he is very proud of his rural roots, since the bountiful nature taught him to be fearless, self-less, and creative.

For the health, peace, progress and fortune of this humble and ever-cheerful and smiling friend, we sing in unison:

“Pashyet sharadah shatam,
Jivet sharadah shatam,
Buddhiyet sharadah shatam,
Rohet sharadah shatam,
Poochet sharadah shatam,
Bhavet sharadah shatam,
Bhuyet sharadah shatam,
Bhuyasee sharadah shatat”

(English translation: May he see through a hundred autumns, May he live through a hundred autumns; May he know through a hundred autumns; May he rise through a hundred autumns; May he remain established through a hundred autumns; May he grow through a hundred autumns, Even more than a hundred autumns!)

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Notes
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