Indian Academy of Sciences elects new Fellows

Amritkar, R. E., Department of Physics, University of Poona, Pune

His significant contributions are: (i) the first observation of novel and important phenomena of wavelength doubling bifurcations, (ii) a new method to characterize the correlations between dynamical systems, (iii) characterizing corrections to multifractals allowing an identification of suble universality classes, (iv) the observation of interesting relation between SLEs for periodic and chaotic orbits and (v) interesting scaling relations for the density in ballistic aggregates.

Anantharamaiah, K. R., Raman Research Institute, C V Raman Avenue, Bangalore

He is a leading radio astronomer specializing in radio spectroscopic studies of the diffused matter in interstellar space. Among his notable contributions are: (i) obtaining the best upper limit to date for the abundance of deuterium in our Galaxy, (ii) the most comprehensive survey of our Galaxy using the radio spectral lines and (iii) clearly demonstrating that the low frequency recombination lines of carbon atoms in interstellar clouds arise due to stimulated emission.

Balakrishnan, N., Supercomputer Education & Research Centre, Indian Institute of Science, Bangalore

He has made original contributions in the areas of electronics, electromagnetics and polarimetric radars. His work on polarimetric Doppler weather radar resulted in the formulation of a framework based on sophisticated electromagnetic scattering models. He was the first to show the significance of zero-lag correlation coefficient between vertically and horizontally polarized radar echoes and also in coming up with an algorithm to estimate the coefficient.

Balasubramanian, A. S., Neurochemistry Laboratory, Christian Medical College Hospital, Vellore

He has contributed to the understanding of the identification of non-cholinergic activities of the enzyme cholinesterase. These include an amine-sensitive aryl acylamidase activity and a peptidase activity. He has also studied the phosphorylation of the phosphomannosyl receptor that mediates transport of lysosomal enzymes.

Bhattacharya, S. K., Physical Research Laboratory, Navrangpura, Ahmedabad

His specialization is in the field of stable isotope applications to problems in earth sciences, with particular emphasis on delineating climatic and environmental changes on a variety of time scales. The isotopic ratios of H, C and O in selected components of tree rings, ocean and lake sediments contain records of environmental and climatic parameters such as rainfall, temperature and salinity. His focus is the high precision determination of these isotopic ratios using stable isotope mass spectrometers and vacuum extraction techniques. His other current research interests include the study of basic isotope fractionation mechanisms in high energy photochemical reactions which have relevance to stratospheric chemistry and isotopic anomalies in meteorites.

Chatterji, Dipankar, Centre for Cellular & Molecular Biology, Uppal Road, Hyderabad

He has been investigating various aspects of the transcriptional regulation of Escherichia coli and his group has made several contributions, which include mapping of the active site of the enzyme RNA polymerase, mode of action of the antibiotic rifampicin on phosphodiester synthetase, mechanism of formation of the competent transcription complex, site-directed mutagenesis of the E. coli transcription factor, subsequent structure-function relationship and stringent regulation of ribosomal RNA synthesis in E. coli.

Ganguli, C., Radiometallurgy Division, Bhabha Atomic Research Centre, Trombay, Bombay

He has several outstanding contributions in development and production of nuclear fuels. These include: hitherto untapped (Pu-16, U-233)C fuel for FBTR, Al-U233 and Al-U-235 plate fuels for research reactors and powder-free sol-gel-microsphere-pelletization (SGMP) and SGMP-LTS (low temperature sintering) processes for remote fabrication of UO2, (U, Pu)O2, (Th, U233)O2, (U, Pu)C and (U, Pu)N.

Ganguly, P., Physical & Materials Chemistry Division, National Chemical Laboratory, Pune

He has made important contributions to the solid state chemistry of transition metal oxides and to surface chemistry. His work on cuprate superconductors has been significant. He developed a novel photoacoustic technique for studying materials/catalysts under flowing gas conditions. His recent work on low-dimensional systems has revealed a new structural model for LB films.

Godwal, B. K., High Pressure Physics Division, Bhabha Atomic Research Centre, Bombay

He has made fundamental contributions in high pressure physics. His theoretical work on shock equation of state of materials and his new model for the difficult 'intermediate' pressure region (50 to 1000 GPa) are highly cited in literature. His determination of melting curve of
lead to pressures of 100 GPa and tempera-
tures near 4000 K using a laser-heated
diamond anvil cell is regarded as the
standard experiment in this area of re-
search. His model for the shift of photoab-
sorption edge of aluminium under laser-
driven shock has initiated various experi-
mental and theoretical activities in this area.
His work on the use of parallel processing
for electronic structure calculations has led to
applications in crystals having a large
number of atoms in the unit cell.

Gupta, A. K., Department of Earth and Plan-
etary Sciences, University of Allahabad, Allahabad
He not only pione-
ered experimental pet-
rology in this country,
but is also known for
his studies on the ge-
ness of pseudosul-
cic, kaolinite-bleiblucite
and forsterite-gross-laitve
structure. His research
and many investigations related to the
origin of feldspar-rich igneous rocks.

Hosur, R. V., Chemical Physics Group,
Tata Institute of Fundamental Research,
Homi Bhabha Road, Bombay
His outstanding con-
tributions are: (i) de-
velopment of a quantum-
mechanical transport
model across bi-layer
membranes, (ii) de-
velopment of scaling tech-
niques in 2D FT NMR
spectroscopy, (iii) de-
velopment of new stra-
tegies for determination of solution con-
formation of nucleic acids, and (iv) develop-
ment of software packages for analysis of
2D NMR spectra. His ideas have resulted in novel developments and appli-
cations in related areas such as solid
state NMR, membrane thermodynamics
and protein–DNA interactions.

Karanidkar, R. L., Indian Statistical Insti-
tute, 7, S. J. S. Sarsenwal Marg, New Delhi
He has made signifi-
cant contribution in the
theory of Martingales
and finitely additive me-
asures in control theory.
Recently he has been
working on infinite-di-
mensial diffusion, which is a new and
difficult area.

Lakhotia, S. C., Department of Zoology,
Banaras Hindu University, Varanasi
He has contributed to
the molecular genetics
of heat shock-
induced gene expres-
sion in Drosophila.
The regulation of ex-
pression and func-
tional significance of
the non-protein coding
heat shock gene at the
93D region of Drosophila melanogaster
and elucidating the regulation of unusual
heat shock response in Malpighian tubules
of Drosophila are major aspects of his work.

Maharana, J., Institute of Physics, Sa-
achivalaya Marg, Bhubaneswar
He has worked on the
phenomenological as-
pects of elementary
particle physics. He
has derived rigorous
results in S-matrix
theory. In recent years,
he has been working on
string theory, es-
specially studying their
symmetries. He has studied wormhole
solutions of string-effective actions.

Malik, S. K., Solid State Physics Group,
Tata Institute of Fundamental Research,
Homi Bhabha Road, Bombay
He was among the
first few who initiated
research on rare earth
magnetism in TIFR
three decades ago. His
work has been in the
area of magnetic, elec-
tronic and transport
properties of rare earth
intermetallic compounds.
The emphasis has been on the valence fluc-
tuation, Kondo lattice and heavy fermion be-
haviour in the class of strongly correlated
electron systems. He has also been working
don high temperature superconductors.

Munivappa, K., Department of Biochem-
istry, Indian Institute of Science, Banga-
lore
He has contributed to
the understanding of
molecular basis of
dNA recombination.
He studied the con-
sequence of recA
protein interaction
with DNA leading to
unprecedented DNA
stretching and reduction of twist of duplex
DNA. He also showed that the narrow
grooves provide the fundamental
framework for binding of recA protein
onto DNA.

Padmanabhan, K. A., Department of Met-
tallurgical Engineering, Indian Institute of
Technology, Madras
He has made signi-
ficant contributions in
superplasticity and
plasticity. His studies on
superplasticity in
compression, activa-
tion energy, numerical
generates and generic
analyses for high
temperature deforma-
tion and theories of superplasticity, grain
boundary sliding, and forming limit
diagrams are well known. His researches
in metal-forming and alloy development
have resulted in technology transfer, import
substitution and patents.

Pal, G. P., Department of Anatomy, M. P.
Shah Medical College, Jammu
He is well known in
the field of biomechanics
and lead transmission of
human spine. He has
shown that besides vertebral bodies
and intervertebral discs, the vertebral
arches and their
zygapophysial joints also play an impor-
tant role in weight transmission. His
studies on the biomechanics of the
thoracic skeleton have helped to under-
stand the mechanism of idiopathic
scoliosis.

Periasamy, M., School of Chemistry, Uni-
versity of Hyderabad, Hyderabad
He has developed
new routes to several
boron and transition
metal organometallic
reagents, suitable for
applications under In-
dian laboratory con-
ditions. He continues
to develop synthetic
organic transformations
utilizing these reagents and also
investigates the mechanisms of organo-
metallic reactions.
Periasamy, N., Chemical Physics Group, Tata Institute of Fundamental Research, Bombay
He has made important contributions in the challenging area of photo-dynamics. Particularly significant are his contributions to solvated-mediated dynamics through picosecond kinetics, time-resolved emission anisotropy and theoretical modelling of translational and rotational diffusion processes.

Prasad Rao, T. S. R., Indian Institute of Petroleum, Dehra Dun
He has made noteworthy contributions in the development and commercialization of state-of-the-art industrial catalysts such as in isomerization, butylal containing and dehydrogenation.

Ramakrishnan, M., Geological Survey of India, Bandlaguda, Sarojnagar P. O., Hyderabad
He was responsible for establishing the presence of ancient schistose rocks in the vast array of younger schist belts (Dharwar Supergroup) which together constitute the most prominent gold-bearing rock formations of Karnataka. He recorded for the first time in Karnataka important rock types like carbonatite, anorthosite, layered basic intrusion etc. He was the main compiler of several thematic maps and the editor of a widely acclaimed memoir on the geology of Southern Karnataka.

Randhir Singh, College of Basic Sciences and Humanities, Haryana Agricultural University, Hisar
He has done pioneering work in the area of photosynthetic carbon metabolism of crop plants. His studies on the metabolic pathways of CO₂ assimilation in fruiting structures of cereals, legumes and Brassica have demonstrated that reproducitive parts of cereals and legumes assimilate CO₂ by a mechanism different than what is known for leaves of either C₃ or C₄ plants. He proposed a detailed metabolic pathway for CO₂ assimilation in reproductive parts of these crops and further hypothesized that fruit photosynthesis has an intermediate status between C₃, non-autotrophic tissue and C₄/CAM photosynthesis. These researches have helped in understanding the mechanism of yield build-up in crop plants and identifying physiological and biochemical constraints which limit yield in major agricultural crops.

Sekharan, K. L., Department of Applied Chemistry, Cochin University of Science & Technology, Cochin
He has developed the theories for the following: (i) vibrational excitation of adsorbrates by electron scattering, (ii) time-dependent coupled cluster theory for the scattering of ions from surfaces, (iii) reaction rates for reactions happening on a continuum of potential energy surfaces, e.g. a reaction happening on a metal surface, and (iv) polymer adsorption on a random surface.

Tej Pal Singh, Department of Biophysics, All India Institute of Medical Sciences, Ansari Nagar, New Delhi
His group is engaged in the X-ray structure determination of industrially important proteins such as bifunctional inhibitors, lactotransferrins, lactoperoxidases and turmerin. His studies on peptides using α, β-dehydro-residues have provided the most useful schemes of peptide design. Studies on the complexes of proteinase K and designed peptides led to the identification of a new and more efficient recognition site in proteases of subtilisin family and have established the rationale of peptide design.

Srikrishna, A., Department of Organic Chemistry, Indian Institute of Science, Bangalore
He has made notable contributions in the area of organic synthesis. He has skillfully developed radical cyclization and annulation-based strategies for constructing a variety of natural products of contemporary interest. He has synthesized about a dozen natural products, most notable being the first total synthesis of Thapsane, a tricyclic sesquiterpene containing a unique carbon framework with stereochemical intricacies.

Srinivas, V., School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay
He is an algebraic geometer of rare versatility with excellent basic contributions in K-theory and other areas of algebraic geometry. He and S. D. Cutkosky proved a long-standing conjecture of O. Zariski on determination of the dimension of certain linear systems. His earlier results on normality of Schubert varieties, self-maps of homogeneous spaces, problems in Hodge theory, etc. show great strength in generating ideas and handling difficult techniques with dexterity.