

LECTURES IN SCIENCE

By

The Faculty Members

OF

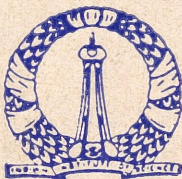
INDIAN INSTITUTE OF SCIENCE, BANGALORE

Sponsored by

The University Grants Commission

FEATURES

- * One-hour lectures by the staff of the Institute on modern Scientific developments in educational and cultural centres in and around Bangalore
- ** WE provide all facilities including transport, accommodation and slide projection, and YOU, in the host organisation, are NOT expected to have any expenditure.
- *** Arranged according to the convenience of the host organisation, and the speakers.



Use the tear-sheet at the end for
making requests for arranging lectures

UGC EXTENSION LECTURE PROGRAM

1975-76

The program presents and material... quantity depend very much on the scientific and technological base of its citizens. With this in mind the Indian Institute of Science, under the aegis of the UGC Extension Lecture Program, has been organizing Extension Lectures by the staff of the Institute in various centres: in institutions of higher learning at the technical level; in engineering and science colleges at the post-graduate level; and in schools and public libraries at the popular level. These extension lectures are expected to be of great help in the transfer of information on the latest scientific developments to the masses and other organizations in India and abroad; they are intended to popularize science and through science educate the public in such a way as to bring about a transformation in their basic thinking—a transformation from the traditional, but dogmatic, attitude to a daring confidence in facing scientifically the challenges of the modern times. The basis of modern science has made man to depend less on nature and fate and more on a rational approach to all his problems—health, material comforts, improved agriculture and industry, and so on.

These lectures on Science, Engineering and Technology subjects are being arranged not only in Bangalore, but also in centres within about 500 km. around Bangalore. Even though the majority of these lectures will be in English, lectures could be arranged in regional languages (Hindi, Kannada, Malayalam, Tamil and Telugu) if there are specific centres for the same.

Many of these lectures are supported by demonstration of films and models where necessary. The Institute provides necessary assistance in the preparation of these lectures and render all other special help such as transport, protection, accommodation and other material expenses. The faculty members of the Institute will be glad to meet the respective public and address them on subjects of popular scientific interest and there is ample choice from a large number of films, slides, etc. covering a wide spectrum of science, engineering and technology.

We shall be glad to co-operate in all ways and extend our help in arranging some of these lectures in the various centres. Only a small amount is required for the lecture and it is our endeavour to take science to all sections of the



K. J. VASU

INDIAN INSTITUTE OF SCIENCE
BANGALORE - 560012

PREFACE

The progress, prosperity and material welfare of the country depend very much on the scientific and technological base of its citizens. With this in mind, the Indian Institute of Science, under the continuing Education Program, has been organizing Extension Lectures by the staff of the Institute in various centres : in institutions of higher learning, at the technical level ; in engineering and science colleges, at the semitechnical level ; and in schools and public/cultural organizations or All India Radio, at the popular level. These extension lectures are expected to be of great help in the transfer of information on the latest scientific developments in this institute and other organizations in India and abroad ; they are intended to popularize science, and through science, educate the public in such a way as to bring about a transformation in their basic thinking—a transformation from the traditional, fate-dependent attitude to a daring confidence in facing scientifically the challenges of the modern times. The fruits of modern science has made man to depend less on nature and fate, and more on a rational approach to all his problems—health, material comforts, improved agriculture and industry, and so on.

These lectures on Science, Engineering and Technology subjects are being arranged not only in Bangalore, but also in centres within about 300 km around Bangalore. Even though the majority of these will be in English, lectures could be arranged in regional languages (Hindi, Kannada, Malayalam, Tamil and Telugu) if there are specific requests for the same.

Many of these lectures are supported by demonstrations or slides and models where necessary. The Institute provides necessary assistance in the preparation of these lectures, and renders all other operational helps such as transport, projection, accommodation and other incidental expenses. The faculty members of the Institute will be glad to meet the receptive public and address them on subjects of topical scientific interest, and there is ample choice from a large number of titles enlisted here, covering a wide spectrum of science, engineering and technology.

We solicit the co-operation of all organizations in and around Bangalore in arranging some of these lectures in the various centres. Only science can achieve prosperity to the country, and it is our endeavour to take science to all sections of the society.

K. I. VASU

Professor, Dept. of Metallurgy
Convener, UGC Extension Lecture Program.

Extension Lectures Sponsored by the University Grants Commission

Program for 1975-76

| No. | Subject of the talk | Department | Name of the Speaker |
|-----|---|--------------------------------------|---------------------|
| 1 | India's atomic explosion | Physics | E. S. Rajagopal |
| 2 | March towards Absolute zero of Temperature | Physics | S. V. Subramanyam |
| 3 | From falling apple to splitting atom (The nature of physical forces) | do | do |
| 4 | Logic and Mathematical Proofs | Applied Mathematics | S. C. Gupta |
| 5 | Applications of vacuum techniques | Central Instruments Services Lab. | Miss. T. S. Radha |
| 6 | Vacuum : Its nature and applications | do | do |
| 7 | Optical thin films | do | do |
| 8 | Thin film micro-electronics | do | do |
| 9 | Ultra high vacuum-Applications | do | do |
| 10 | Vacuum | do | do |
| 11 | World of thin films | do | do |
| 12 | Applications of lasers | Central Instruments Services Lab. | B. S. Ramprasad |
| 13 | Holography | do | do |
| 14 | Optical Interferometers | do | do |
| 15 | Instruments for measurement | do | do |
| 16 | Industrial applications of Vacuum Science and Technology | do | do |
| 17 | Nature of light | do | do |
| 18 | Holography : Three-dimensional picture | do | do |
| 19 | Magic Square | Central Instruments Services Lab. | S. Namperumal |
| 20 | Mathematical Table Generation | do | do |
| 21 | Arrangement of Numbers | do | do |
| 22 | Playing games with computer | do | do |
| 23 | Printing chess board etc | do | do |
| 24 | What is a computer and how to use it ? | do | do |
| 25 | Programming in FORTRAN | do | do |
| 26 | Modern Algebra | do | do |
| 27 | Numerical Techniques in Programming | do | do |

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|----|---|------------------------------------|-----------------------|
| 28 | Integrated circuits: What are they and how are they fabricated | Central Instruments Service Lab | R. Rama Krishna |
| 29 | Transducers | do | do |
| 30 | Electronic time measurement | do | do |
| 31 | How, Why, What of Satellites | do | do |
| 32 | The mistakes that led to marvels | do | do |
| 33 | Edison, the ideal scientist | do | do |
| 34 | Science clubs, their role in making future scientists | do | do |
| 35 | Science fair projects : choosing, executing, presenting | do | do |
| 36 | Present trend in Polymer Research | Inorganic & Physical Chemistry | U. S. Nandi |
| 37 | Metal ion Interaction of Nucleic acids and their role as anti-cancer agents | do | do |
| 38 | Polymers, their present-day use and future possibilities | do | do |
| 39 | Giant Molecules | Inorganic & Physical Chemistry | A. R. Vasudeva Murthy |
| 40 | Peaceful uses of atomic energy | do | do |
| 41 | Crystal Kingdom | do | do |
| 42 | Chemistry in ancient India | do | do |
| 43 | Modern Chemotherapy and Indian medicine | do | do |
| 44 | Electron Spectroscopy | Inorganic & Physical Chemistry | S. S. Krishnamurthy |
| 45 | Phosphazenes: A group of Phosphorus-Nitrogen Compounds | do | do |
| 46 | Chemistry and Man | Inorganic & Physical Chemistry | Mrs. D. K. Padma |
| 47 | People who have influenced the world | do | do |
| 48 | Chemistry and Technology of Rocket Propellants | Inorganic & Physical Chemistry | K. Kishore |
| 49 | Recent advances in chemical Rocket Propellants | do | do |
| 50 | Future of Hybrid Rocket Motors in Space Missions | do | do |
| 51 | Problems of Vitamin-A Deficiency in India | Biochemistry | J. Ganguly |
| 52 | Life processes under extreme environmental conditions | Biochemistry | T. Ramasarma |
| 53 | Biological rhythms | do | do |

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|----|--|--|------------------------|
| 54 | Animal Virus | Microbiology & Cell Biology Lab | A. Antony |
| 55 | Viruses and Life | Microbiology & Cell Biology Lab | T. Ramakrishnan |
| 56 | Cancer : i. Carcinogenesis and chemotherapy of cancer ii. Biology of cancer iii. A youth looks at cancer (English and Kannada) | Microbiology & Cell Biology Lab do do | M. Sirsi do do |
| 57 | i. Contraceptives and physiology of reproduction ii. Contraceptives : chemical control of fertility | do do | do do |
| 58 | Noise : an environmental pollutant-health hazards | do | do |
| 59 | Cosmetics and complexion | do | do |
| 60 | Chemical and Biological warfare | do | do |
| 61 | Is old age inevitable : Biology of old age | do | do |
| 62 | Naming of Organic Compounds | Organic Chemistry | S. N. Balasubrahmanyam |
| 63 | Shapes of Organic Molecules | Organic Chemistry | D. Devaprabhakara |
| 64 | Shapes and Orientation of Atomic and Hybrid Orbitals | do | do |
| 65 | Organoboranes in Organic Synthesis | do | do |
| 66 | Woodward-Hoffmann Rules : Electrocyclic Reaction | do | do |
| 67 | Mathematics in engineering curricula in North American Universities | Electrical Communi- cation Engg | V. K. Bhargava |
| 68 | The splendour of Electrical Communication | do | do |
| 69 | From Aryabhata to Ramanujan: Development of Indian Mathematics | do | do |
| 70 | Solar Cells For Space & Terrestrial applications | Electrical Communi- cation Engg | D. N. Bose |
| 71 | Integrated Circuit Technology | do | do |
| 72 | Opto electronics and Display Devices | do | do |
| 73 | Recent Trend in Mordern Electronics | Electrical Engg | V. Joshi |
| 74 | Search for Fusion Power | do | do |
| 75 | Technology of Transistors | do | do |
| 76 | Atmospheric Pollution from mobile sources | Chemical Engg | M. Ravindram |
| 77 | Magic Square | Centre for Theoretical Studies | B. S. Madhava Rao |
| 78 | Number curiosities | do | do |

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|-----|---|-------------------------------------|------------------------------------|
| 79 | Lighting | High Voltage Engg | M. S. Naidu |
| 80 | A comparison of standard of living in U. S. A. and in India (English & Kannada) | School of Automation | M. R. Chidambara |
| 81 | Automation | School of Automation | I. G. Sarma |
| 82 | India and space | Aeronautical Engg | S. K. Shrivastava |
| 83 | Journey to the Planets | do | do |
| 84 | Satellite Applications | do | do |
| 85 | Space Exploration | Aeronautical Engg. | C. V. Joga Rao |
| 86 | Helicopter | do | do |
| 87 | Solar Weather Relations | Aeronautical Engg. | S. Ramakrishna |
| 88 | Aircraft Electronics | do | do |
| 89 | Satellites in the Service of Man | do | do |
| 90 | Shock waves and Sonic Booms | Aeronautical Engg. | R. Narasimha |
| 91 | Dynamics of Aircraft (with demonstrations & papermodels) | Aeronautical Engg. | S. P. Govinda Raju |
| 92 | Waves in Science and Engineering (with demonstration using a mechanical wave guide) | do | do |
| 93 | Unemployment and its impact on modern youth | Industrial Management | Mrs. V. S. Shanthamani |
| 94 | Role of Costing in Industrial Management | Industrial Management | K. S. Hanumantha Rao |
| 95 | Finance Function in Modern Management | do | do |
| 96 | Cost and Financial Ramifications of R & D Management. | do | do |
| 97 | Nobel Laureates in Economics | Industrial Management | N. Somasekhara |
| 98 | The Relevance of Karl Marx in the present times | do | do |
| 99 | Planning Models and their applications | do | do |
| 100 | The Economy of Karnataka | do | do |
| 101 | Water Pollution | [Civil Engineering Biochemistry | K. V. N. Sarma M. K. C. Sridhar |
| 102 | Mixing in river | Civil Engineering | K. V. N. Sarma |
| 103 | What do we know about concrete | Civil Engineering | C. S. Viswanatha |
| 104 | Historical Development of Pumps (Kannada & English) | Civil Engineering | H. S. Govinda Ram |
| 105 | Cavitation in Hydraulic Machines (English & Kannada) | do | do |

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| 106 | Energy Problems and mini Power Plants (English & Kannada) | Civil Engineering | H. S. Govinda Ram |
| 107 | Materials Science and Technology for Civil Engineers | Civil Engineering | T. S. Nagaraj |
| 108 | Testing of Concrete, Rocks and Soils in Engineering practice | do | do |
| 109 | Role of probability & Statistics in Civil Engineering | do | do |
| 110 | Aerodynamics of Turbomachines | Mechanical Engineering | S. Soundranayagam |
| 111 | Power for flight | do | do |
| 112 | Solar Energy | do | do |
| 113 | Fluidics | Mechanical Engg. | R. Hariharan |
| 114 | Numerical Control | do | do |
| 115 | Holes in Solids | Metallurgy | G. N. K. Iyengar |
| 116 | Recent trends in Gas-Solid reactions | do | do |
| 117 | The internal structure of materials around us | Metallurgy | E. S. Dwarakadasa |
| 118 | Exploring the atom : The atom probe | do | do |
| 119 | The unseen world of materials through the electron microscope | do | do |
| 120 | Superplasticity : when metals behave like plastics | Metallurgy | Y. V. R. K. Prasad |
| 121 | Metallurgy in Ancient India : The Glory that was (English & Malayalam) | Metallurgy | K. I. Vasu |
| 122 | Metal Finishing for pleasure and profit | do | do |
| 123 | Why do metals behave the way they do | do | do |
| 124 | Understanding corrosion and corrosion Prevention | do | do |
| 125 | Story of Radioactive Metals : From radium to Atom bombs | do | do |
| 126 | Kinetics & Mechanism of Metal Deformations | Metallurgy | D. H. Sastry |
| 127 | A hundred years of Metallography | Metallurgy | M. Mohan Rao |
| 128 | Human Language and Language of Animals | Foreign Languages | D. Thakur |
| 129 | Steels : What makes them so strong | Metallurgy | Kishore |
| 130 | Intestinal Parasites | Health Centre | B. S. Subba Rao |
| 131 | Science Society/Libraries | Library | T. K. S. Iyengar |
| 132 | Utilization of Solar Energy | Mechanical Engg. | K. K. Prasad |

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|-----|---|-------------------|-----------------|
| 133 | Crystals and how they are grown | Physics | P. S. Narayanan |
| 134 | Lasers and their uses | do | do |
| 135 | Ferroelectric crystals and their applications | do | do |
| 136 | Non-linear optics | do | do |
| 137 | Optical crystals and devices employing electro-optical crystals | do | do |
| 138 | Lasers and their applications (in medicine ; in industry ; in defence) | Elec. Comm. Engg. | S. D. Mehta |
| 139 | Holography and its applications | do | do |
| 140 | Optical computer and picture processing | do | do |
| 141 | Optical illusions | do | do |
| 142 | Technology of precision optics | do | do |
| 143 | Optical communication | do | do |
| 144 | Experiments in Modern optics (with demonstrations) | do | do |
| 145 | Cryptography : Language of Secret communication | do | do |
| 146 | Solar energy utilization | do | do |
| 147 | Remote sensing | do | do |
| 148 | Atomic Arrangements in Solid Materials | Metallurgy | D. H. Sastry |

Special Program

Eradication of the poisonous weed : **Parthenium hysterophorus**

By

Talk in English or Telugu

P. V. Subba Rao

Biochemistry Department

REQUEST FOR UGC EXTENSION LECTURES

Please send this request at least 2-3 weeks in advance of the date fixed for the lecture.

This form should be used if you have **fixed the date** for lectures, in which case it would be helpful if you suggest one or two alternate lectures as well. This will help us in fixing one of these lectures.

| Date | Choice of lectures (denoted by the numbers given in this booklet) | | | | |
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Choice of lectures (denoted by the numbers given in this booklet)

Date

1 of 2

2 of 2

3 of 2

4 of 2

5 of 2

6 of 2

7 of 2

8 of 2

9 of 2

10 of 2

Table with 10 rows and 2 columns for listing lecture choices and dates.

REQUEST FOR UGC EXTENSION LECTURES
(Copy for retention in your Office)

Please send this request at least 2-3 weeks in advance of the date fixed for the lecture.

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Lecture of ... as indicated by their numbers given in this booklet

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Choice of lectures (denoted by the numbers given in this booklet)

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REQUEST FOR UGC EXTENSION LECTURES

(Copy to Ministry at your Office)

Please send this request at least 2-3 weeks in advance of the date fixed for the lecture.

Please use this form if you are specifically interested in a **particular lecture**, in which case it would be helpful if you suggest one or two alternate date for this lecture.

Lecture of interest to us (denoted by their numbers given in this booklet)

Suitable Dates

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From :

For further details, please contact :

Phone: 30011 Extn. 262

Dr. K. I. Vasu
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Deputy Registrar (Academic)
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Indian Institute of Science
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