RESEARCH FUNDING & SCIENCE POLICIES

Kallol K. Ghosh

School of Studies in Chemistry

Pt. Ravishankar Shukla University, RAIPUR

Pt. Ravishankar Shukla University

Raipur - 492 010, Chhattisgarh, India

Vision

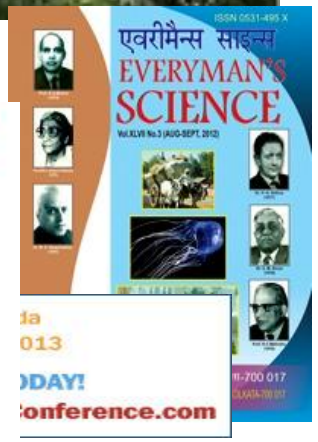
To be a world-class University, achieving excellence in higher education and research through incessant competency building

Mission

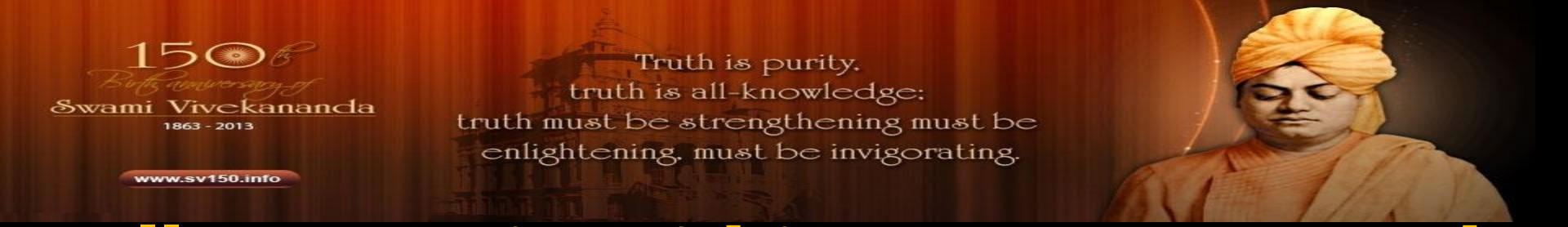
1. To establish Pt. Ravishankar Shukla University as one of the centers of excellence in the realm of higher education & research at the National and International levels
2. To create conducible environment for the promotion of quality teaching and research
3. To make the students self-reliant, self-esteemed and ethical so that they maintain sanctity of life and contribute to the society
4. To collaborate with the peer institutions, industry and government in the development and application of new knowledge for the benefit of society

Golden Jubilee Year
50
1964 – 2014
www.prsu.ac.in

ACKNOWLEDGEMENT



Web Site : DST, UGC, CSIR, SREB, DBT, CCOST



- **All power is within you; you can do anything and everything. Believe in that, do not believe that you are weak; do not believe that you are half-crazy lunatics, as most of us do nowadays. You can do any thing and everything, without even the guidance of any one. Stand up and express the divinity within you."**

- ब्रह्माण्ड कि सारी शक्तियां पहले से हमारी हैं. वो हमीं हैं जो अपनी आँखों पर हाँथ रख लेते हैं और फिर रोते हैं कि कितना अन्धकार है!

- **“The Higher Education Scenario across the globe is changing and Indian universities need to come up with a comprehensive plan to meet the challenges and demands of the future. It is important for the state governments to include higher education in the priority list,”**
- **Prof Ved Prakash, Chairman, University Grants Commission (UGC)**

RUSA: Plan to Revamp Indian Higher Education

- **Union Ministry of Human Resource Development has launched its ambitious programme to revamp the higher education sector in the country, Rashtriya Uchchatar Shiksha Abhiyan (RUSA). Through RUSA it aims to cover 316 states public universities and 13,024 colleges across the country.**

- **The government is looking at brining various reforms to improve the quality of higher education sector by creation of a State Higher Education Council, creation of accreditation agencies, preparation of the state perspective plans, commitment of certain stipulated share of funds towards RUSA, academic, sectoral and institutional governance reforms, filling faculty positions** tc.

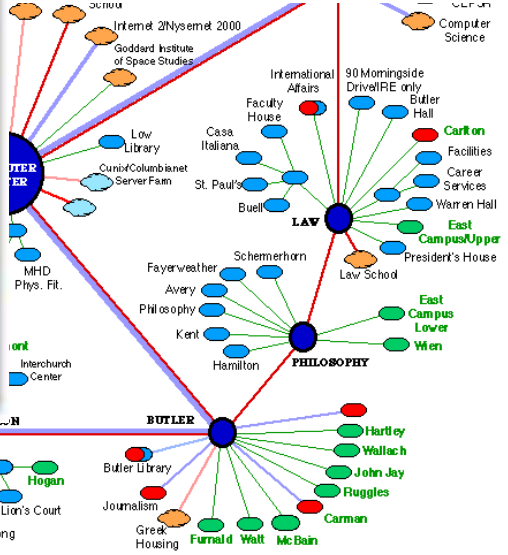
- **Greater Emphasis will be laid on the Improvement of the Quality of Teaching-Learning Processes in order to produce Employable and Competitive Graduates, Post-graduates and PhD**

- **TEACHING AND RESEARCH ARE THE INTEGRAL PART OF HIGHER EDUCATION**

- **Research and Teaching should be seen as activities that can be mutually beneficial and that the demonstrated excellence of its teaching provision and research profile are interlinked.”**

Science then, then and now

A vast amount of information



Every university should identify a group of 10 to 20 'inspired teachers' who can ignite the minds of the students to learn beyond the text books. If such teachers interact with each other as well as with the students, the quality of teaching could be enhanced. Their lectures could also be relayed to remote educational institutions through NMEICT Networks," President added.

Title : RESEARCH FUNDING & SCIENCE POLICIES

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- A G E N D A
- OBJECTIVE
- SCIENCE & TECHNOLOGY POLICIES
- FUNDING OPPORTUNITIES
- NATIONAL/ INTERNATIONAL
- CONCLUSION

No.	Funding Agencies	Title of the Project Including Sanction Letter No.	Total Amount	Total Period	Result
1.	University Grants Commission, New Delhi	Kinetic Study of the Acid Promoted Hydrolysis of Hydroxamic Acids. (CHM 90/203)	12,000 = 00	1991-1993	Completed
2.	Department of Science and Technology (Young Scientist), New Delhi	Mechanistic Studies of the Acidic Hydrolysis of Some Carbon and Nitrogen Substituted Hydroxamic Acids (SR/OY/C-21/91)	2,26,900 = 00	1992-1995	Completed
3.	University Grant Commission, New Delhi	Reactivity and Mechanism of Alkaline Hydrolysis of Hydroxamic Acids. (F. 12-42/93 SR-94), 28-01-94	1,29,000 = 00	1994-1997	Completed
4.	M. P. Council of Science and Technology, Bhopal	Kinetic Studies of Micellar Hydrolysis of Hydroxamic Acids (C-88/92)	98,800 = 00	1994-1998	Completed
5.	Department of Science and Technology, New Delhi	Acid-Base Equilibria and Metal Complexation of Hydroxamic Acids: Applications to DNA Cleavage (SP/S-1/G-28/94)	13,77,520 = 00	1997-2001	Completed
6.	Pt.Ravishankar Shukla University (UGC Unassigned Grant)	Characterization and Properties of Mixed Micelles and Polymer Micelles as Reaction Media (1253/GrantCell/MRP/2001),23. 08. 2001	20,000 = 00	2001- 2003	Completed
7.	Council of Scientific and Industrial Research (CSIR), New Delhi	Interfacial Reactivity of Hydroxamic Acids in Microorganized Media (01/1825/02/EMR-II) 7-8-02	6,88,000 = 00	2002- 2005	Completed
8.	Defence Research Development Organization (DRDO), New Delhi	Detoxification of Some Simulants of Chemical Warfare Agents and Pesticides Using Hydroxamic acids (ERIP/ER/0303406/M/01)	21,00,000 = 00	2004-2007	Completed
9.	University Grants Commission (UGC), New Delhi	Size Controlled Silver and Gold Nanoparticles Synthesis in Organized Assemblies (F-30-85/2004(SR)	80,000 = 00	2005-2006	Completed
10.	Council of Scientific and Industrial Research (CSIR), New Delhi	Study of Enzymatic Hydrolysis of Carboxylate and Phosphate Esters in Micelles(01(2143)/07/EMR-II 30.03.07)	7,46,000 = 00	2007-2010	Sanctioned

No.	Funding Agencies	Title of the Project Including Sanction Letter No.	Total Amount	Total Period	Result
11.	University Grants Commission, New Delhi	Studies on Physicochemical and Thermodynamic Properties of Some Gemini Surfactants	600000=00	2009-2011	Completed
12.	Defence Research And Development Organization, New Delhi	Synthesis and Development of Novel Oxime Reactivators of Cholinesterases Inhibited by Organophosphate Toxicants	3900, 000=00	2012-2015	ONGOING
13.	Council of Scientific and Industrial Research (CSIR), New Delhi	Solubilization of Polycyclic Aromatic Hydrocarbons Using Novel Surfactants Mixtures	1420030=00	2012-2015	ONGOING
14.	Department of Biotechnology, New Delhi	Quantum Dot Nanomaterials and Conjugation of Medicinal Important Biomolecules	57.95 LAKHS	Submitted by Dr M L SATNAMI & K K GHOSH Co-PI	May 2013
		I			
				2	

- **For any Country to Grow Economically and Develop Opportunities, the field of Research forms a very Important Aspect.**

- **Apparently, this is also responsible for building up a strong infrastructure thereby improving the living conditions of the society and builds an eco-system of growth and progressive thoughts.**

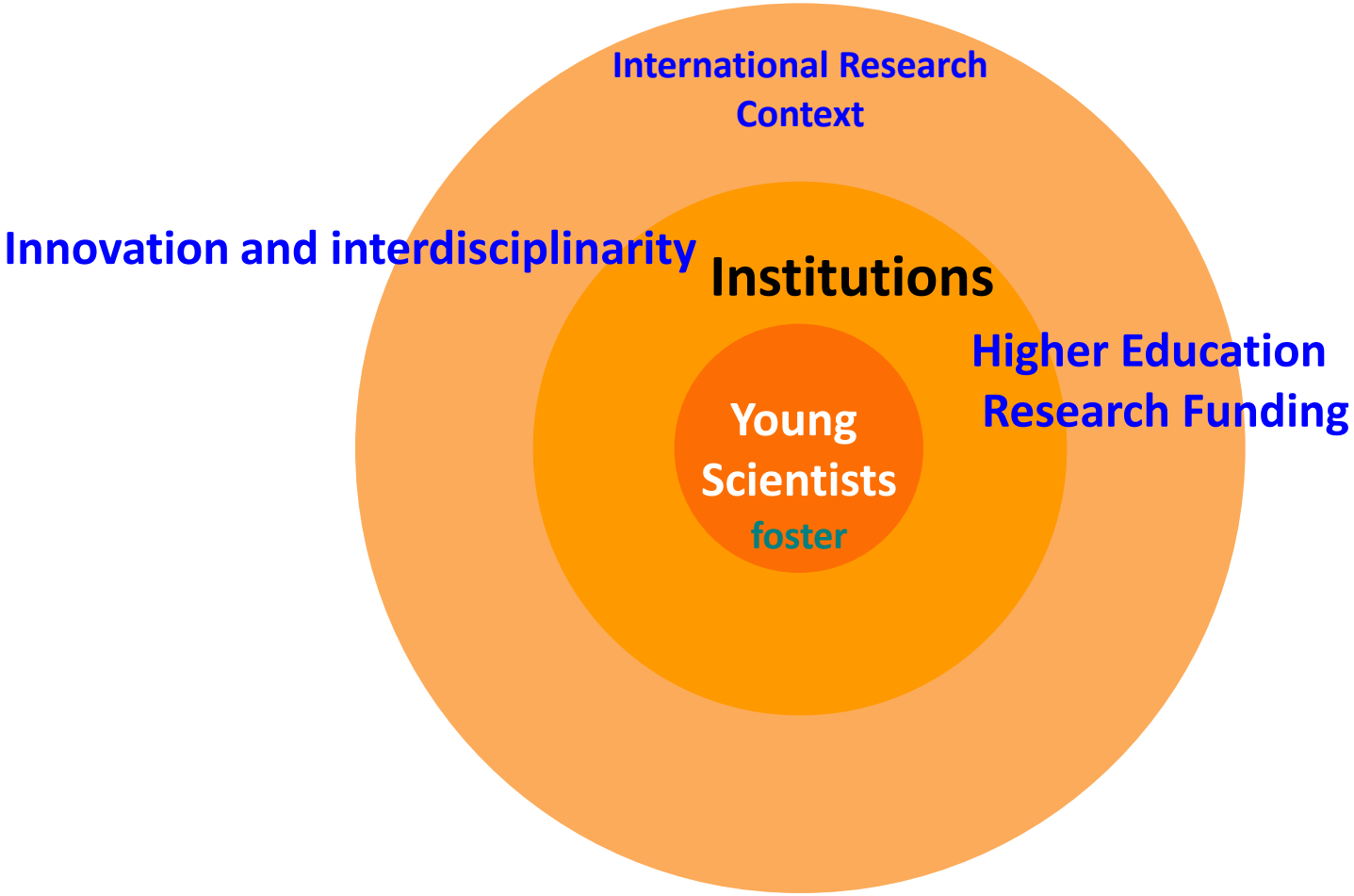
-

- **However, the key factor for this to be successful is the involvement of students in the research field.**

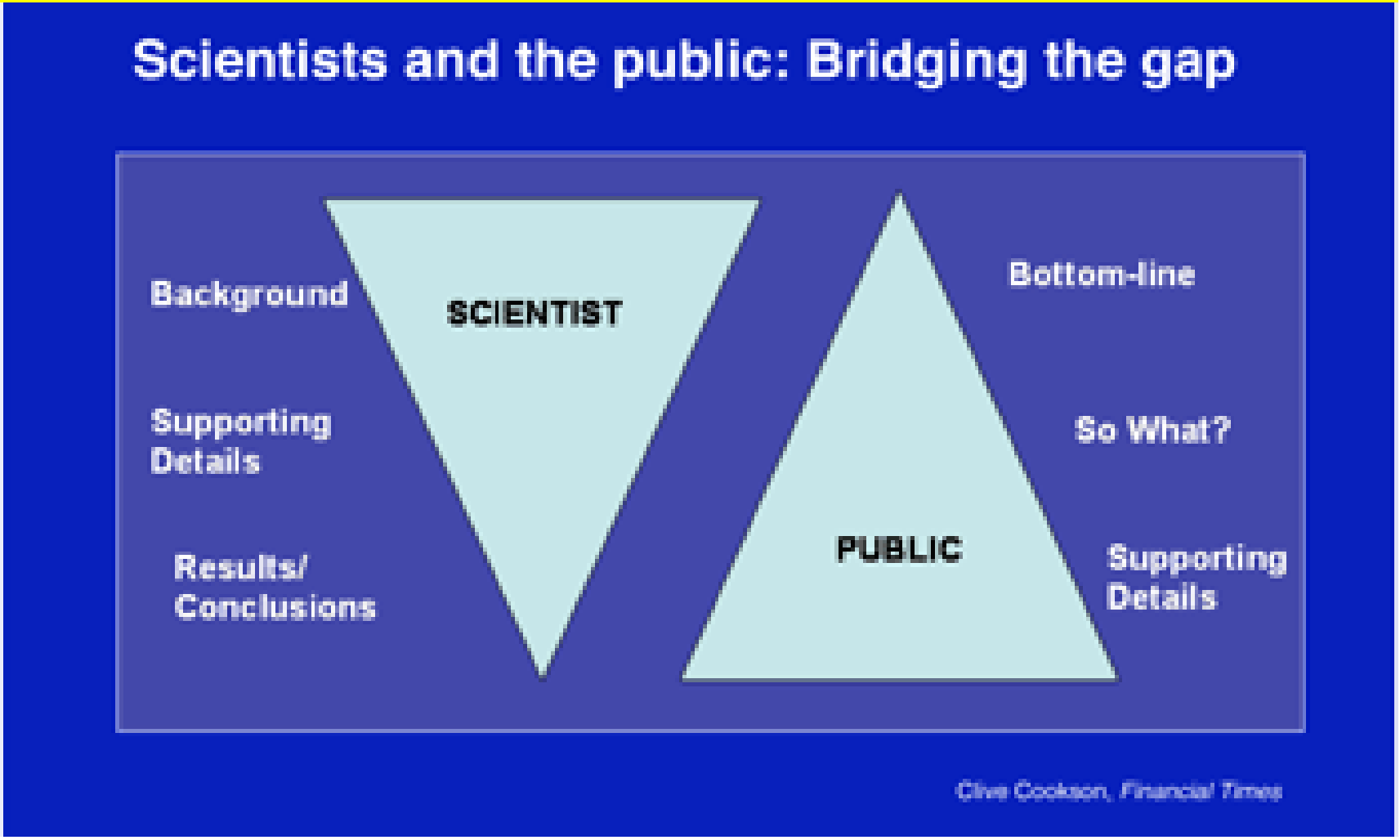
- **The Growth of the Best Scientific Minds for Research and Development in the Country.**

- SCIENCE, TECHNOLOGY and INNOVATION: Working together towards growth and development

Situation of Science and Research System



SCIENCE and Development

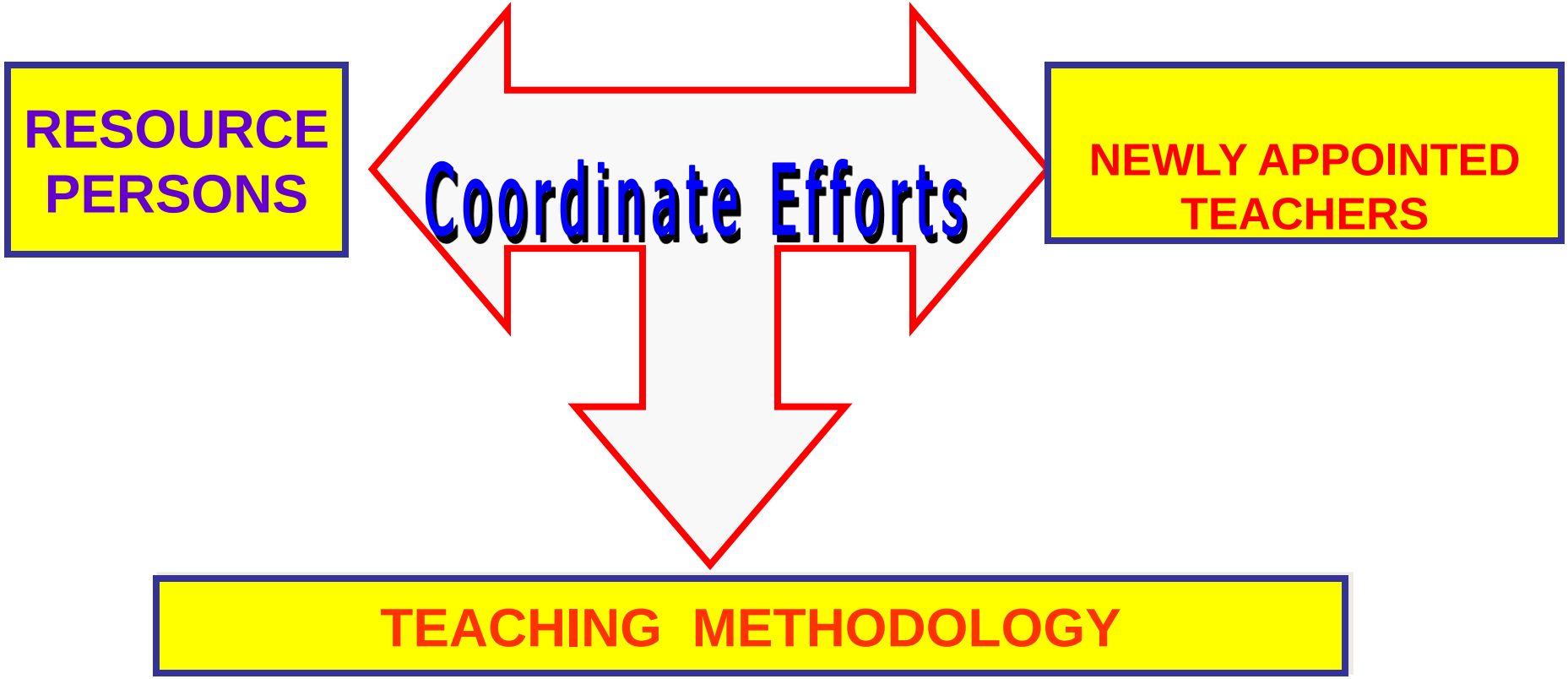


Long Term Objectives

- **By Organizing a ASC Orientation Course on the Issues of Common Concern, We (?) are Interested in Generating (??) AWARENESS and CONCERN among STAKEHOLDERS ( ) through Interactions, Cross – Debates.....etc. etc.**

GENERAL AWARENESS

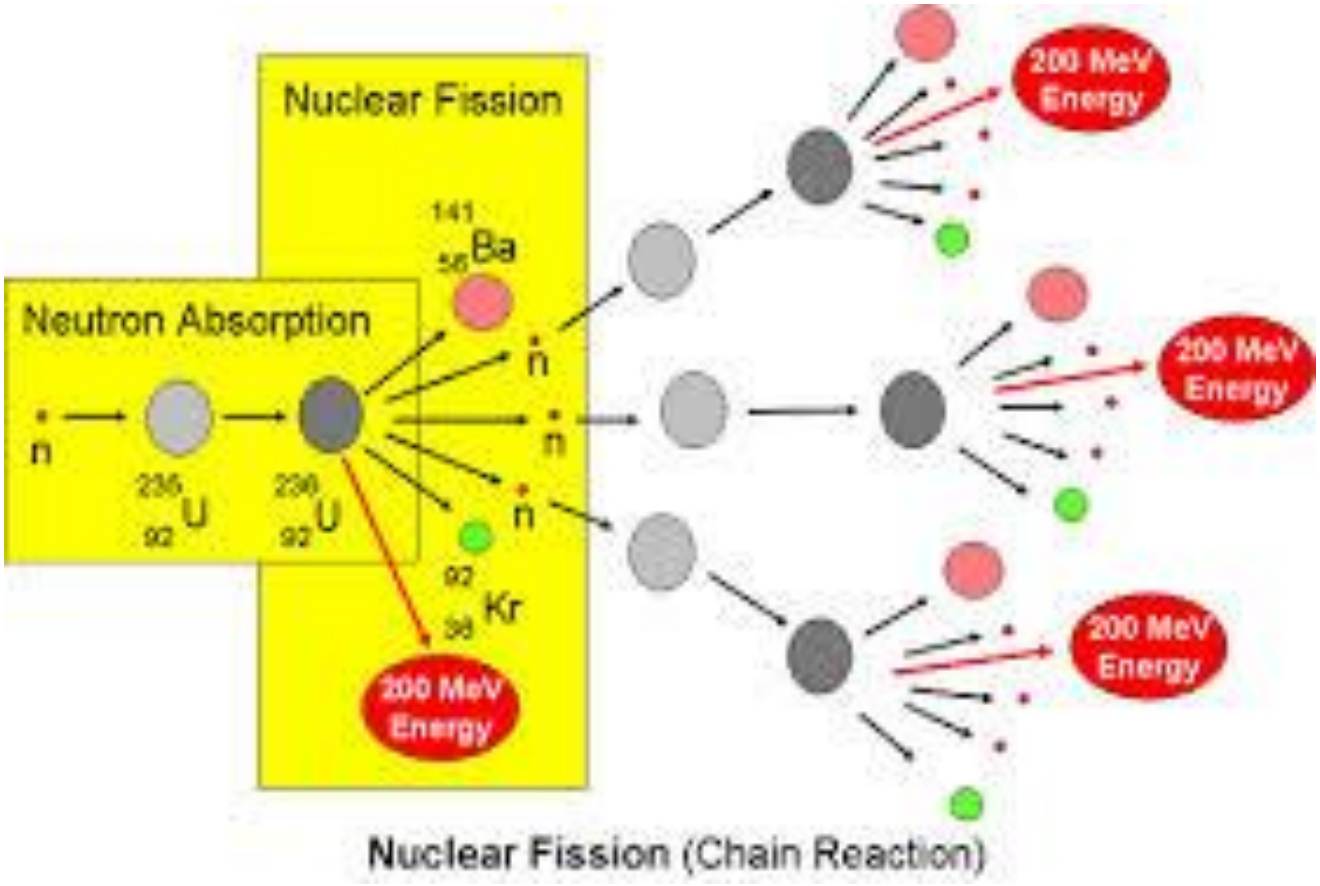
How does it work?



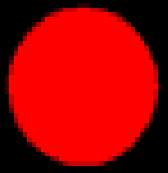
HUMAN LIFE FOR HAPPY FUTURE

- Remember Science is not just doing the Research, but it is also about your knowledge that DISSEMINATING stems from your research.

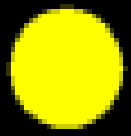
Student : Uranium
Teacher : Neutron



Nuclear Fission Chain Reaction

 — ^{235}U

 — Neutron

 — Fission Product

Ground Realities

- Institutional Weaknesses and Structural Problems in INDIAN SCIENCE,
- How the Chronic Gap between Goals and Achievement will be Bridged ?

Compartmentalization

- **No Opportunities for Developing Interdisciplinary Research SKILLS,**

EXPERTISE & INFRASTRUCTURE

- **i)Need and justification for the facility including the equipment(s);**

  ii) Proposed organisational structure;

  iii)Details of R&D programme of scientists from other institutions/ departments interested in using the facility;

  iv) The competence and area of research of the PI(s) or Group of PI(s) along with the Bio-data of the programme team;

  v) Self-Assessment reflecting specific competence of the Principal Investigator(s) for undertaking the programme and justification for choosing the location of the proposed facility;

  vi) Necessary supporting documents from the users may be attached along with the proposal.

  vii) Participation of the Parent Institution (financial)/ other S&T agencies/ State Government Departments or private industry (financial as well as technical) in such projects

- We Need Cross-Fertilization of Disciplines and Synergy Among Stakeholders. PM

- **University : The Barometer of Science and Technology**

- **The Universities are the backbone of Scientific and Technological Training and the University Research Still forms the Super Heads of Scientific Progress.**

- **Universities/Colleges Educate Young Minds and Create Aware and Dynamic Citizens.**
- **But much more than this, Universities Generate New Ideas and Encourage Innovation**.

- **Universities and Research institutions in India need to realign their curriculum to this policy and enable students to think and act scientifically.**

- **We should equip students to innovate, and create employment and solutions in key areas,**

- Dr. Deepak Pental , Former VC, DU

- New Science Policy to Upgrade Research and Collaboration

The Science Policy(2013)

- To produce and nurture talent in science,
- To stimulate research in our universities,
- To develop young leaders in the field of science, to reward performance
- To create a policy environment for greater private sector participation in research and innovation
- To forge international alliances and collaborations to meet the national agenda.

India's Position Among Top Scientific Powers

- **Science, Research and Innovation System for High Technology-led path for India (SRISHTI)**

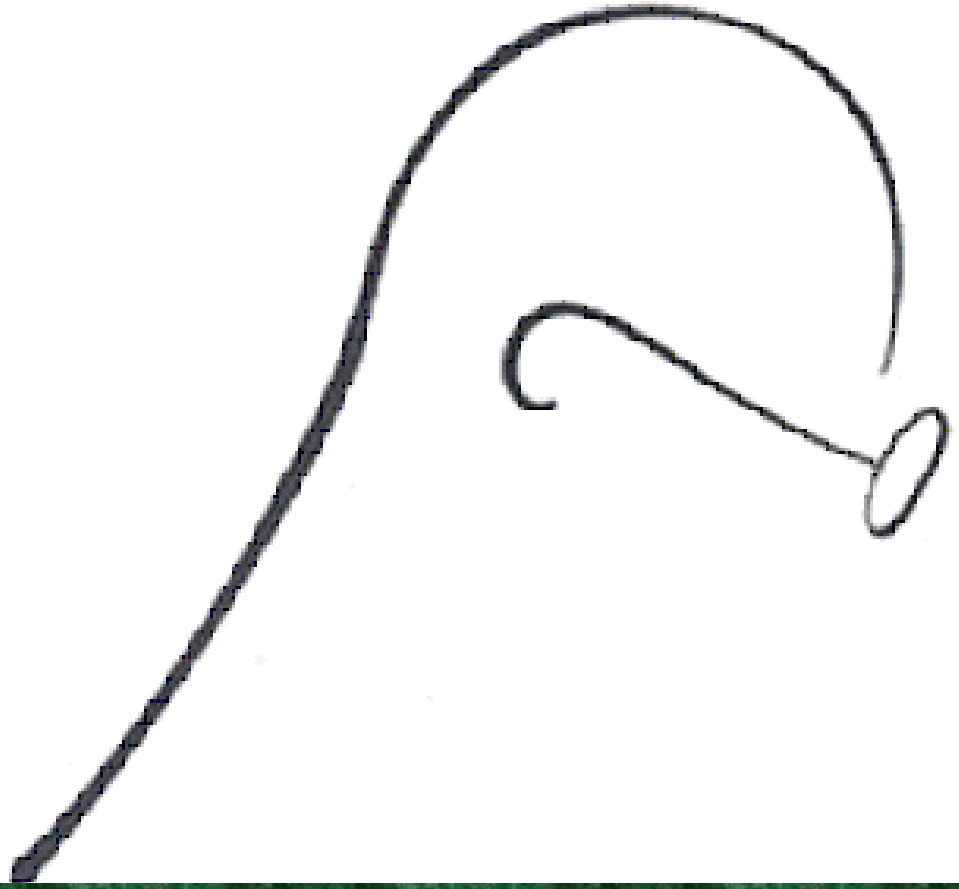
सृष्टि सृजन

- Promoting the spread of scientific temper amongst all sections of society.

- Enhancing skill for applications of science among the young from all social strata.

- Making careers in science, research and innovation attractive enough for talented and bright minds.

- Empowering women through appropriate STI inputs and investments



A technological society has two choices. First it can wait until catastrophic failures expose systemic deficiencies, distortion and self-deceptions…

Secondly, a culture can provide social checks and balances to correct for systemic distortion prior to catastrophic failures.

- **The Nobel Laureate Richard Feynman had famously said, ‘the difficulty with science is often not with the new ideas, but in escaping the old ones. A certain amount of irreverence is essential for creative pursuit in science.’**

2010-2020

- **The Decade of Innovation for India.**

SPECIFIC OBJECTIVES

- TO PROMOTE RESEARCH IN NEWLY EMERGING FRONTIER AREAS OF SCIENCE AND ENGINEERING INCLUDING MULTIDISCIPLINARY FIELDS.
- TO SELECTIVELY PROMOTE THE GENERAL RESEARCH CAPABILITY IN RELEVANT AREAS OF SCIENCE AND ENGINEERING TAKING INTO ACCOUNT CAPABILITY OF THE HOST INSTITUTIONS.
- TO ENCOURAGE YOUNG SCIENTISTS TO TAKE UP CHALLENGING R&D ACTIVITIES.
- TO ENCOURAGE PATENTING FACILITIES TO SCIENTISTS AND TECHNOLOGISTS IN THE COUNTRY FOR INDIAN AND FOREIGN PATENTS ON A SUSTAINED BASIS.
- TO GIVE SPECIAL ENCOURAGEMENT TO PROJECTS FROM RELATIVELY SMALL AND LESS ENDOWED UNIVERSITY DEPARTMENTS AND INSTITUTIONS.

When You Take Care of Yourself You Also Help the Earth

PROMOTION OF UNIVERSITY RESEARCH AND SCIENTIFIC EXCELLENCE(DST)

FIST Program: 2000 - 2009

State-wise Distribution of Institutes/ Universities & Departments

(No. of Universities [No. of Departments])

H INDEX		AMOUNT
50		30 CRORE
40-49		15 CRORE
30-39		9.0 CRORE
26-29		6.0 CRORE

India is positioned at 12th rank among the top 20 countries in Science & Technology

'Indian Scientific Research Enters New Era

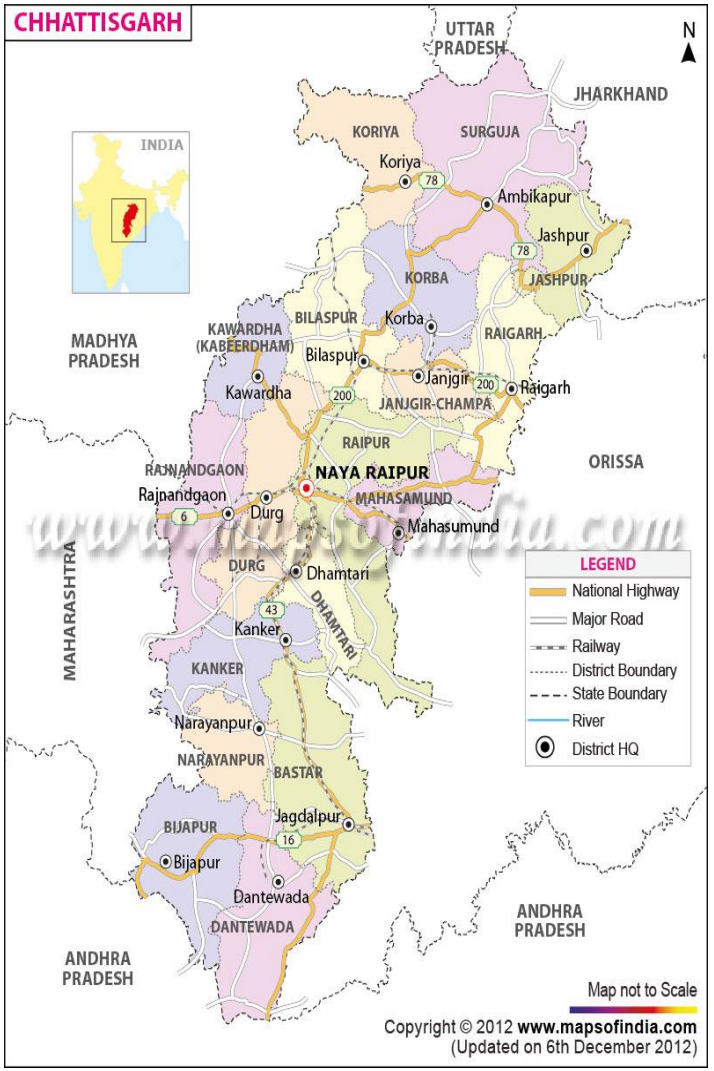
- **"World's Largest Democracy is aiming for status as a Scientific Power House".** JRF Fellowship

- India has to become a global leader in science:
- Prof. CNR Rao

INSTITUTIONAL MEMBERS

- Central Universities : 44 , Universities :680
- **IIT : 16, NIT :20, IISER: 5 , NISER: 01**
- **IISc-01 IIIT- 4 IIIT Bangalore-01,IIM : 13**
- **CSIR LAB: 42**
- **DRDO LAB : 20**
- **Department of Space/Atomic Energy: 21**
- **ICAR: 38 ; ICMR : 20; DST :16 DBT : 08**
- **Public Private R and D ;;;;;;;UGC Chairman,CS,All VC, Principals : 23.2.13**

- [Chhattisgarh Swami Vivekanand Technical University,]
- [Guru Ghasidas University,]
- [Hidayatullah National Law University,]
- [Indira Gandhi Krishi Vishwavidyalaya,]
- [Indira Kala Sangeet Vishwavidyalaya,]
- [Kushabhau Thakre Patrkarita Avam Jansanchar]
- [Pandit Ravishankar Shukla University,]
- [Pandit Sundarlal Sharma (Open) University,]
- Baster University
- Sarguja University
- Kamdhanu University
- Ayus University
- Mats University
- Bilaspur University
- CV Raman University
- NIT
- AIIMS
- IIM



WORLD RANKING OF INSTITUTIONS

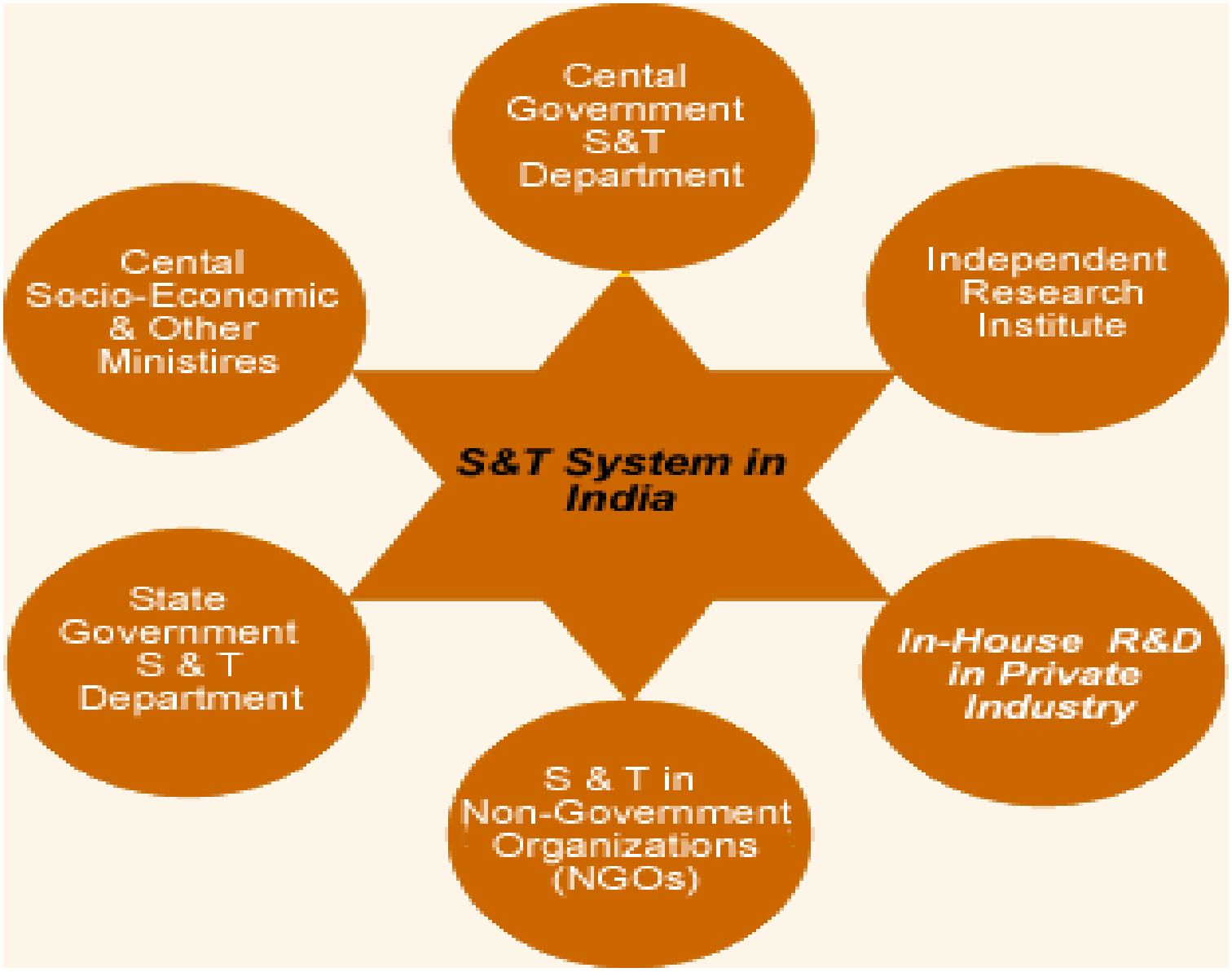
- None of the IITs and Other Good Institutions finds a place among the top 200 Educational Institutions
- 2012
- IITB 227
- IITD 212
- IITK 278
- IITM 312

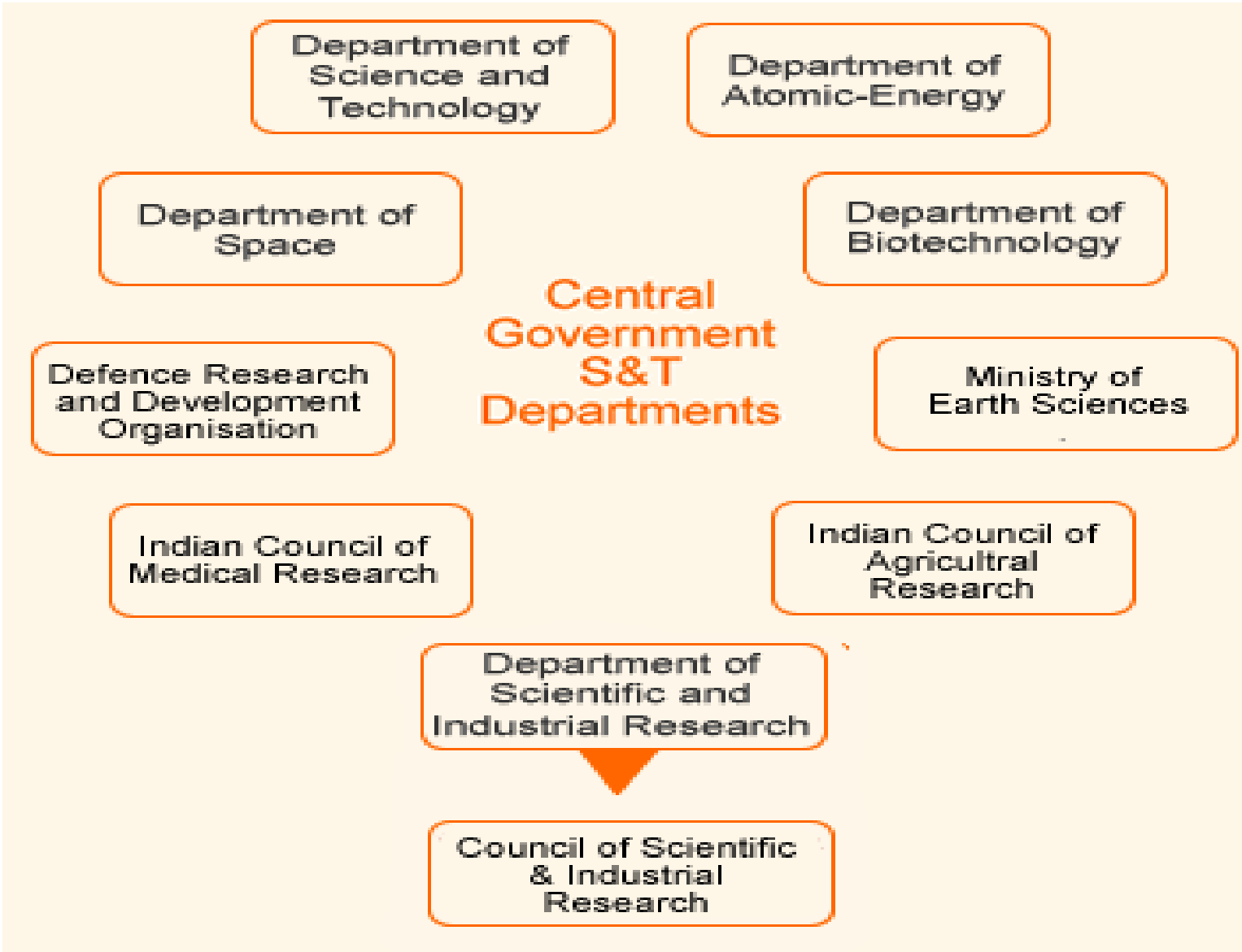
IIT Kharagpur has been ranked 30th with an overall score of 41.6, IIT Bombay stands at 33rd position with a score of 40.6 and IIT Roorkee has been ranked 56 with the overall score of 29.9.

While, none of the institutions from India has been able to get into the list of top 25.

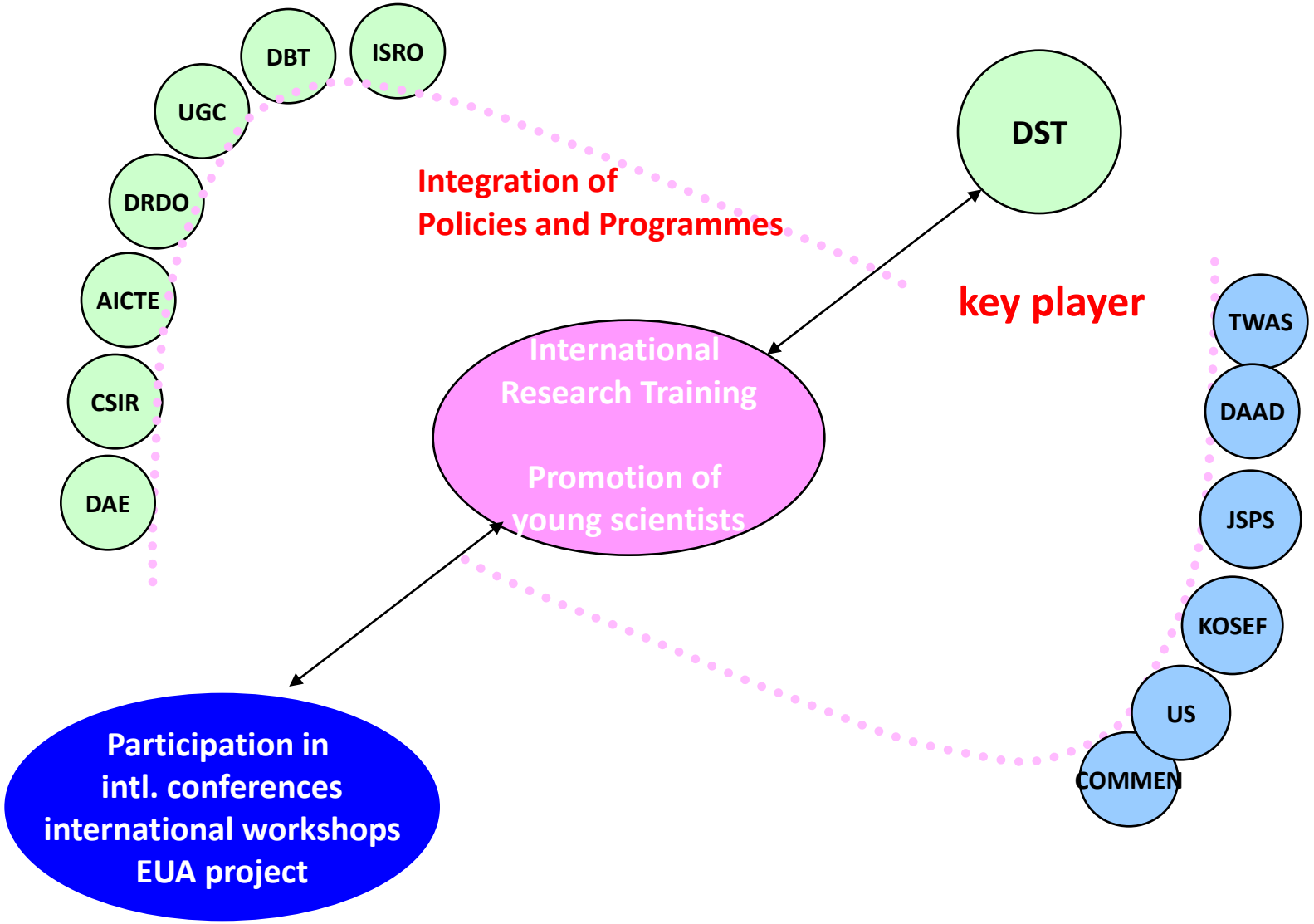
Engineering Students at 3 Levels in USA and INDIA

	USA	INDIA
UG	75000	15,00,000
	(5% of India)	
PG	37500	75000
	(50% of India)	(5% of UG)
PhD	7500	1500
	(500% of India)	(0.1% of UG)


Cental Government S&T Department
Cental Socio-Economic & Other Ministires
Independent Research Institute
S&T System in India
State Government S & T Department
In-House R&D in Private Industry
S & T in Non-Government Organizations (NGOs)


Department of Science and Technology
Department of Atomic-Energy
Department of Space
Department of Biotechnology
Central Government S&T Departments
Defence Research and Development Organisation
Ministry of Earth Sciences
Indian Council of Medical Research
Indian Council of Agricultral Research
Department of Scientific and Industrial Research
Council of Scientific & Industrial Research

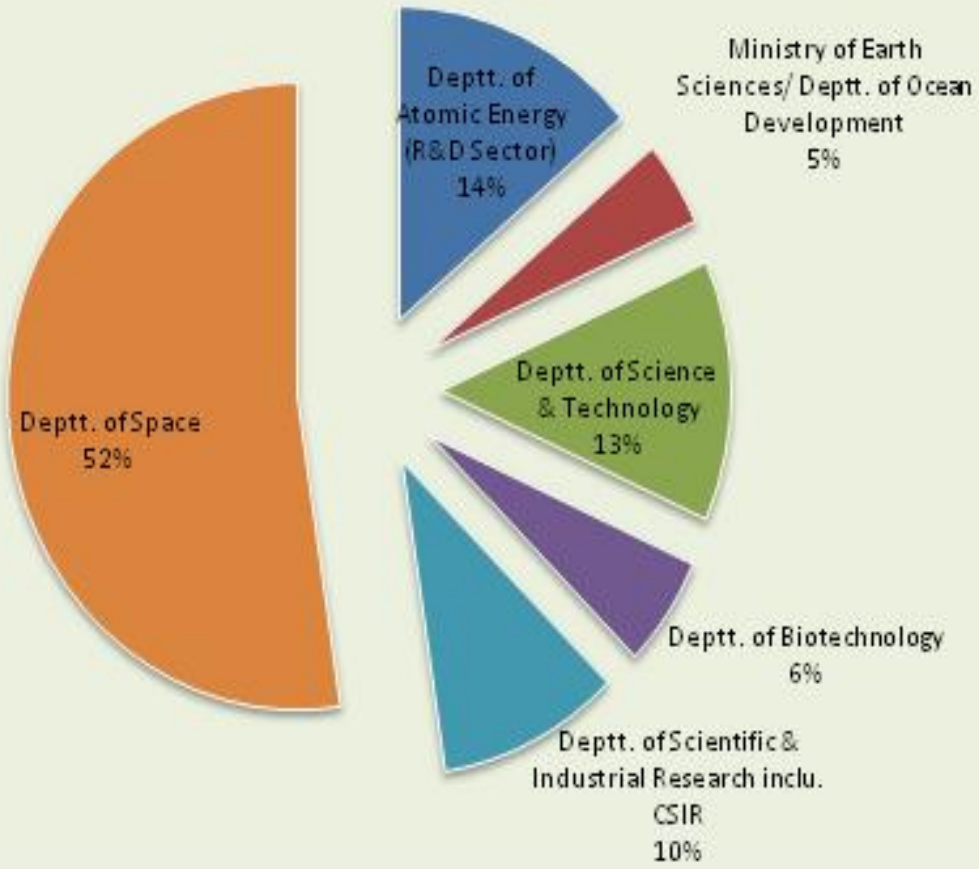
Network International Research Training



Collaborations: The rise of Research Networks

Chidambaram's focus on education in budget 2013 - 2014, funds increased by 17 percent

Education top priority of Govt, gets 65,867 Cr; 100 Cr for skill development


Deptt. of Atomic Energy (R&D Sector) 14%
Ministry of Earth Sciences/ Deptt. of Ocean Development 5%
Deptt. of Science & Technology 13%
Deptt. of Biotechnology 6%
Deptt. of Scientific & Industrial Research inclu. CSIR 10%
Deptt. of Space 52%

G-7 COUNTRIES

- **There is still some way to go before the BRICK research bases generally match [the] impact benchmarks" of the G7 advanced countries (the United States, the United Kingdom, France, Germany, Italy, Canada, and Japan).**

- **The report highlights these countries' public and private investments in research and development, their scientific and engineering labor forces, their output of research papers and particularly active areas of research, their academic impact as measured by citations, and their economic potential based on innovation and patenting.**

PUBLICATIONS

- **According to the report brought out in November, 2012, India published 65,487 research articles compared to 3,30,818 by China in 2012.**
- **However, during the period 2008-12 the total number of research publications was 2,60,696 for India and 13,02,177 for China.**
- **The report further provides details of competencies of research publications in 16 major scientific fields in terms of citation impact with India having a higher value of 0.68 as compared to 0.53 of China during 2008-12.**

BRIC/BRICK NATIONS

- The rising quantity and quality of research in the BRIC nations—Brazil, Russia, India, and China—has been gaining attention for years now.
- A new report from Thomson Reuters adds a fifth country, South Korea, and a new acronym, BRICK countries, finding "clear evidence of a growing wedge of excellent research" occurring in all these nations.
-

India Boosts Science & Innovation Budget

India has hiked funds for its ministry of Science and Technology by 20 percent in its 2013-14 annual budget.

India's finance minister allocated US$1.15 billion (62.7 billion rupees) for the ministry of science and technology in a 22 percent hike.

The department of atomic energy gets US$1.08 billion, and the space department that is gearing for India's first Mars mission in November gets US$1.03 billion in the budget unveiled on February 28.

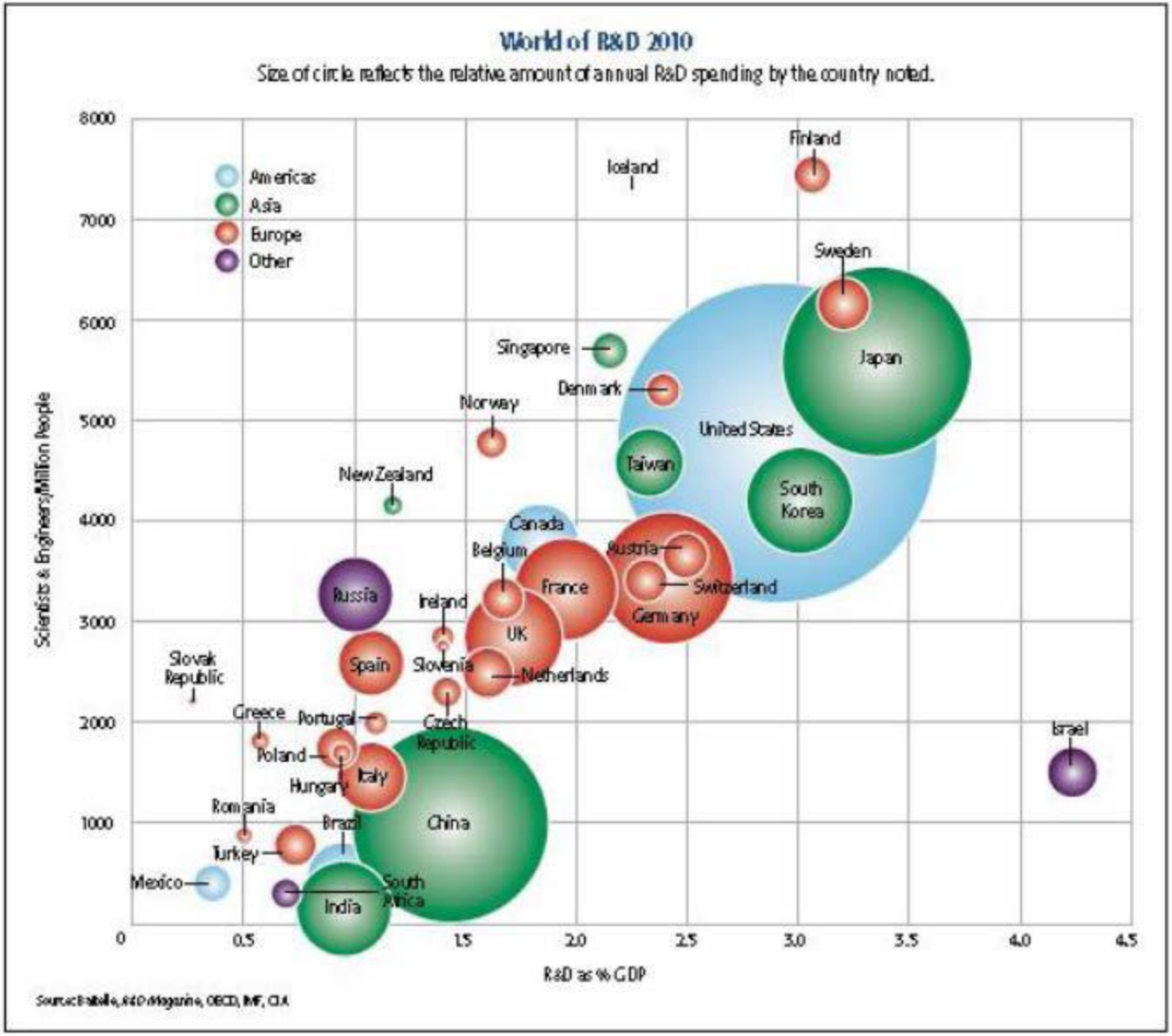
GDP

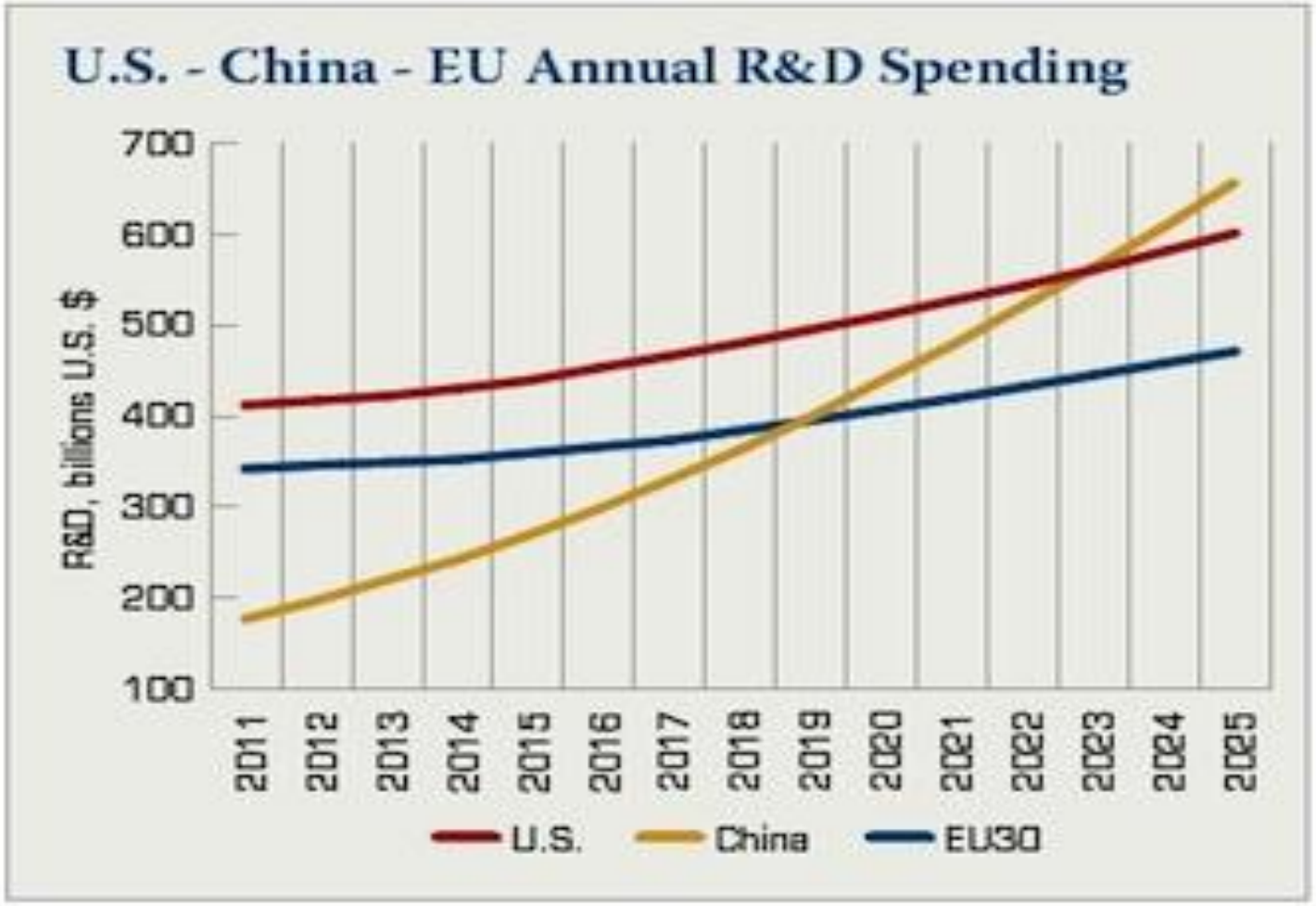
- Increasing accomplishment in research has thus far generally gone hand in hand with rising gross domestic product (GDP) in each nation. "Greater GDP implies that there may be more money available to invest in R&D, leading to greater innovation and competitiveness, thus sustaining the economic growth trajectory."

List of countries by research and development spending

Rank	Country/ Region	Expenditures on R&D (billions of US$, PPP)	% of GDP PPP	Year	Source
1	United States	405.3	2.7%	2011	[2]
2	China	296.8	1.97%	2012	[3]
3	Japan	160.3	3.67%	2011	[4]
4	Germany	69.5	2.3%	2011	[2]
5	South Korea	55.8	3.74%	2011	[4]
6	France	42.2	1.9%	2011	[2]
7	United Kingdom	38.4	1.7%	2011	[2]
8	India	36.1	0.9%		

PM said the aim should be to increase the total R&D spending as a percentage of the GDP to two per cent by the end of the 12th Plan period.

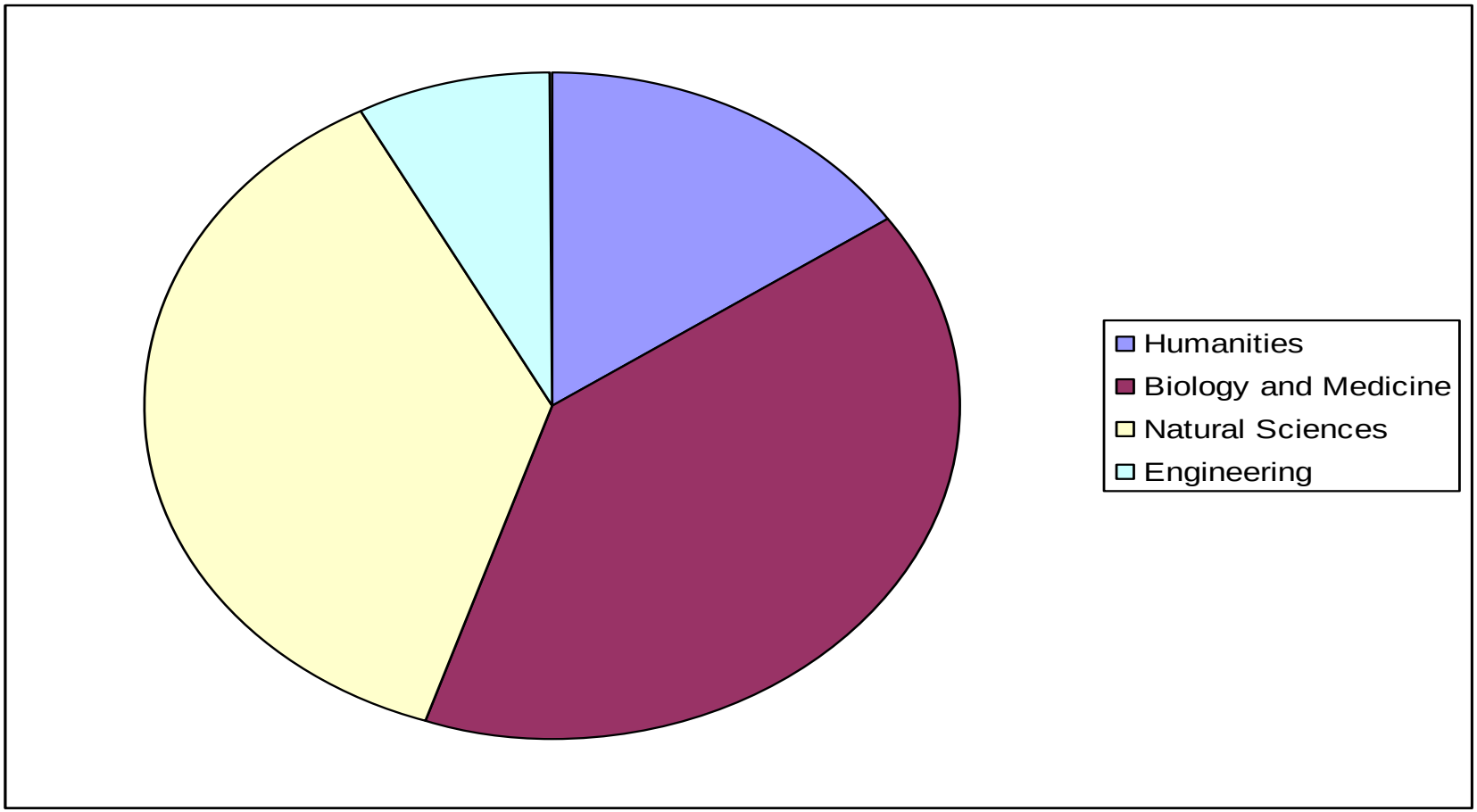

World of R&D 2010
Size of circle reflects the relative amount of annual R&D spending by the country noted.
Americas
Asia
Europe
Other
Scientists & Engineers/Million People
R&D as % GDP
8000
7000
6000
5000
4000
3000
2000
1000
0
0.5
1.5
2.0
2.5
3.0
3.5
4.0
4.5
Finland
Iceland
Sweden
Japan
Singapore
Denmark
Norway
United States
Taiwan
South Korea
New Zealand
Canada
Belgium
Austria
France
Switzerland
Germany
Russia
Ireland
UK
Spain
Slovenia
Netherlands
Slovak Republic
Greece
Portugal
Czech Republic
Poland
Hungary
Italy
Israel
Romania
Brazil
China
Turkey
Mexico
South Africa
India



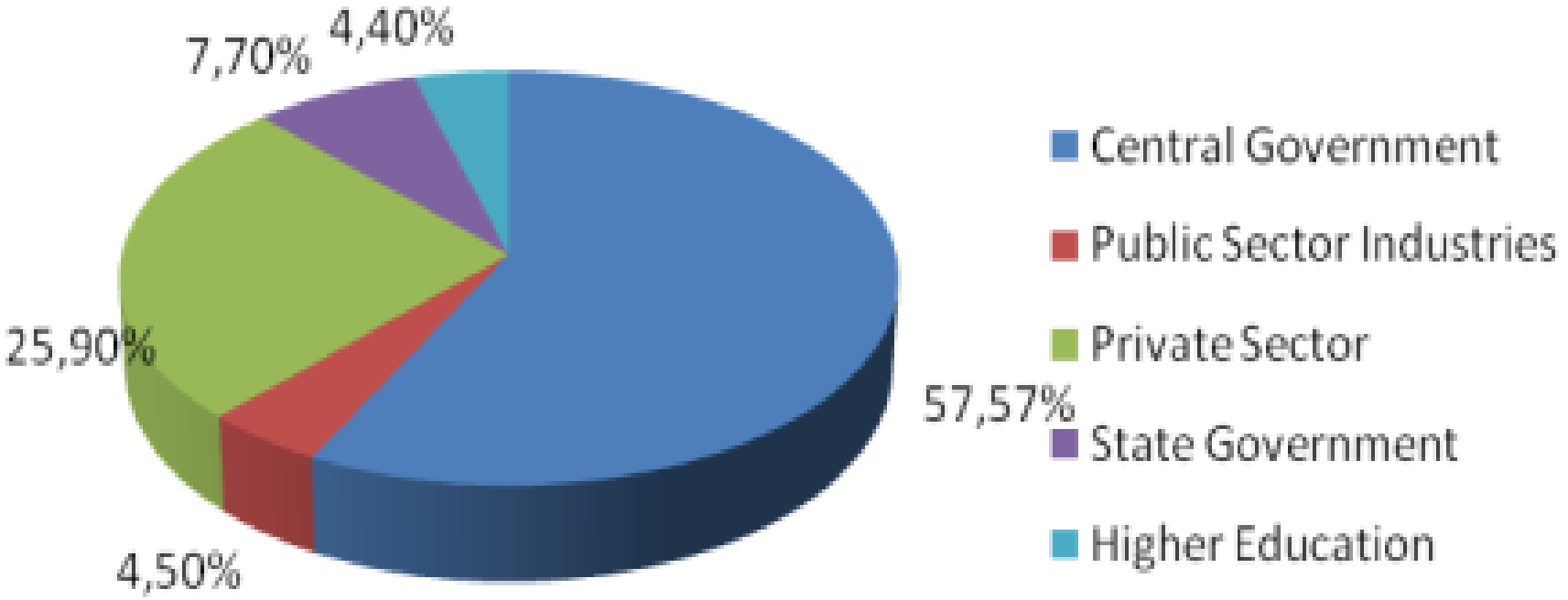
Source: Battelle/*R&D Magazine*

- **"The U.S. still has a significant lead and advantage in R&D over all of these countries," "but the concern is R&D is a long-term investment, and as these other countries continue to grow their R&D capabilities ... how long can we maintain that advantage?"**

Research Training Groups by Disciplines



Sectorwise R&D Expenditure



- **However, India still has a lot to do. Its spending on sciences R&D is paltry 0.9 percent of its GDP which is extremely low compared to nations like China or Brazil. In US this figure is 2.5 percent of the GDP.**

- **A recent McKinsey report says that India can aspire to become an innovation hub by 2020.**

- **But this requires globally competitive research infrastructure, world-class talent, funding, private-public partnerships and enabling regulatory environment.**

Research Needs

Infrastructure,

Investment,

Mentorship and

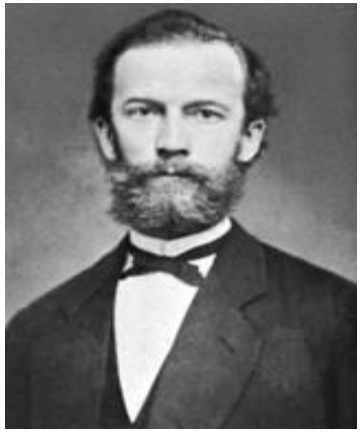
Passion


जून

MGK Menon

- **We talk of creating a world class university**. Can you create these without change in attitudes?
- **So what I'm really driving at is we must have the right attitudes. And that is more important than anything else. Value Systems.**

RESEARCH & TEACHING OPPORTUNITIES WHERE YOU ARE



F. Kohlrausch, Germany

S.A. ARRHENIUS, Sweden

L. Boltzmann, Austria

W.Ostwald, Russia

J H Vant Hoff, Amsterdam

- **FUNDING OPPORTUNITIES**

FUNDING AGENCIES(Govt. of India)

1. All India Council for Technical Education (AICTE)
2. Council of Scientific and Industrial Research (CSIR)
3. Defence Research and Development Organisation (DRDO)
4. Department of Atomic Energy (DAE)
5. Department of Ayurveda, Yoga & Naturopathy, Unani , Siddha
6. Department of Biotechnology (DBT)
7. Department of Coal (DOC)
8. Department of Ocean Development (DOD)
9. Department of Science and Technology (DST)
10. Department of Scientific and Industrial Research (DSIR)

11. Indian Council of Medical Research (ICMR)
12. India Meteorological Department (IMD)
13. Indian Space Research Organisation (ISRO)
14. Ministry of Communications & Information Technology
15. Ministry of Environment and Forests (MOEF)
16. Ministry of Food Processing Industries (MFPI)
17. Ministry of Non-Conventional Energy Sources (MNES)
18. Ministry of Power, Central Power Research Institute
19. Ministry of Social Justice & Empowerment (MOSJE)
20. Ministry of Water Resources (MOWR)
21. Petroleum Conservation Research Association (PCRA)
22. University Grants Commission (UGC)

Start-Up Research Grant (Young Scientists) DST

The Scheme provides Opportunities to Young Scientists (below 35 years) for pursuing exciting and innovative research in frontier areas. The Start-up research grant is a structured scheme to reap the benefit of research potentials of young minds for speeding up the processes and enhance the relative position of the Indian R&D system in global competitiveness. The scheme limits the total cost of the project upto Rs. 23.0 lakhs (excluding overhead charges) for a period of 3 years. A lump sum amount of Rs 35,000/- pm is being paid to Young Scientists as fellowship on these projects provided he/she is not employed nor is recipient of any other fellowship.

Indian Council of Social Science Research

- **(ICSSR) provides grants to scholars to conduct research in various fields of social sciences which have a theoretical, conceptual, methodological or policy orientation on the subject of their choice. The research projects may belong to any one of the following social science disciplines or may be interdisciplinary in nature:**

- Economics / Commerce / Management / Business Administration;
- (ii) Sociology and Social Anthropology / Social Work / Demography / Gender Studies
- (iii) Political Science / International Relations / Geography / Public Administration
- (iv) Psychology / Education /Criminology
- (v) Other-Linguistics / legal Studies / National Security Studies etc.

RESEARCH PROJECTS SPONSORED

- The Indian Council of Social Science Research (ICSSR), under its Sponsored Studies Programme, invites proposals from individual/group of scholars/institutions for commissioning research studies in the following Thrust Areas of Social Science Research under the 12th Five Year Plan 2012-2017. proposals to be considered in the next financial year 2013-2014, last date of **receiving application is 30 June 2013**.
- Applications may be submitted to:

- DEPUTY DIRECTOR (RPS)
- INDIAN COUNCIL OF SOCIAL SCIENCE RESEARCH
- ARUNA ASAF ALI MARG
- NEW DELHI-67
- Online application may be sent to e-mail: rachnajain1955@gmail.com duly followed by a hard copy.

INDIAN COUNCIL OF PHILOSOPHICAL RESEARCH

- Indian Council of Philosophical Research was set up by the Ministry of Education, Government of India as an autonomous organization for the promotion of research in Philosophy and allied discipline.

- It scrutinizes and sanctions grants-in-aid for the projects and other proposals received or planned by the council.

Cognitive Science Research Initiative

- Granting agency: Science and Engineering Research Council, Department of Science and Technology, India
- Address: Technology Bhavan, New Mehrauli Road, New Delhi - 110016
- Duration: Three years
- Support: Full research grants
- Individual scientists working in the areas of cognitive science
- Including, foundations of cognition; language and cognition; computational intelligence, cognitive psychology and cognitive neuroscience.
- The nature of support is not fixed and depends on the proposal.

DEPARTMENT OF SCIENCE AND TECHNOLOGY, NEW-DELHI

Scientific Research

- Science and Engineering Research Board
- Nano Science and Technology Initiative
- Chemical Sciences
- Physical Sciences
- Life Sciences
- Engineering Sciences
- Intensification of Research in High Priority Areas (IRPHA)
- CERN-India Collaborative Projects
- Earth & Atmospheric Sciences
- Seminars/Symposia and Assistance to Professional Bodies

Science and Engineering Research Board

- For Those who want to Apply for a Program/Scheme:
-
- The board operates many Schemes and Programs.
-
- Schemes
- Extra Mural Research Funding (Individual Centric)
- Start-Up Research Grant (Young Scientists)
- Utilisation of Scientific Expertise of Retired Scientists (USERS)
- Grant Based Research Funding (Under Formulation

35 FEROZESHAH ROAD,
NEW DELHI 110 001

Phone: +91 11 23382321, +91 11 23386973
Fax: +91 11 23383421
Email: ms_ichr@rediffmail.com
Chairman: Phone- +91 11 23386033 +91 11 23384869 Fax- +91 11 23383421

Center for Indian Language Technology (CFILT)

- It was set up with a generous grant from the Department of Information Technology (DIT), Ministry of Communication and Information Technology, Government of India in 2000 at the Department of Computer Science and Engineering, IIT Bombay. Prior to this the Natural Language Processing (NLP) activity of the CSE Department, IIT Bombay took off in 1996 with a grant from the United Nations University, Tokyo to create a multilingual information exchange system for the web. The project called Universal Networking Language (UNL; www.undl.org) was participated in by 15 research groups across continents. Contact Us
- Prof. Pushpak Bhattacharyya Department of Computer Science and Engineering, IIT Bombay,
Powai, Mumbai - 400076. INDIA
- email: pb@cse.iitb.ac.in

- Central Institute of Indian Languages
  Department of Higher
  Education,Language Bureau
  Ministry of Human Resource
  Development
  Government of India
  Manasagangothri, Hunsur Road, Mysore
  570006
  Tel: +91-821-2515820 (Director)
  Reception/PABX : +91-821-2345000
  Fax: +91-821-2515032 (Off)

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION (AICTE)

- **Thrust Area programme in Technical Education (TAPTEC)**

- **Research and Development (R&DP)**

- ***All Engineering, Technology and Management Institutions including IITs, IIMs, University Departments, Deemed Universities, Regional Engineering Colleges, Government and aided engineering colleges recognised by All India Council of Technical Education can apply under the above scheme***.

- **Biotech engineering**
- **Chemical engineering, pharmacy and food science**
- **Civil engineering, environmental science, and architectu**
- **Computer science**
- **Electrical, electronics and communications**
- **Management**
- **Material science, energy science and metallurgy**
- **Mechanical, production and industrial engineering**

•Council for Technical Education
IG Complex, IP Estate
New Delhi 110 002
Tel: 3353821,3351747
Fax:011-3352539
E-mail:
jpg@aicte.ernet.in

DEFENCE RESEARCH & DEVELOPMENT ORGANISATION

Ministry of Defence, Govt. Of India

DRDO sponsors new research projects in the area of basic science/applied sciences under DRDO Grants-in-Aid Scheme to various academic institutions and R&D labs outside the boundaries of DRDO

LIFE SCIENCES RESEARCH BOARD (LSRB)

The Secretary,
Life Sciences Research Board
Directorate of Life Sciences
Defence Research & Development Organisation,
Chanakya Bhawan.
New Delhi – 110021 E-mail : dls_drdo@hotmail.com Web : www.drdo.org

NAVAL RESEARCH BOARD (NRB)

The Member Secretary
Naval Research Board
Directorate of Naval R&D
5th Floor, Chanakya Bhawan
Vinay Marg, Chanakyapuri
New Delhi – 110 021. E-mail : dnrdoff@drdohq.res.in Web : www.nrbdrdo.res.in

EXTRAMURAL RESEARCH/INTELLECTUAL PROPERTY RIGHT (ER/IPR)

Directorate of ER & IPR
IIIrd Floor, B wing
Room No 348 & 349, DRDO Bhawan
New Delhi- 110011 E-mail : erip_er@drdohq.res.in


Council of Scientific and Industrial Research
Anusandhan Bhawan, 2 Rafi Marg, New Delhi-110001, India
Serve the Nation

Human Resource Development Group

Council of Scientific & Industrial Research

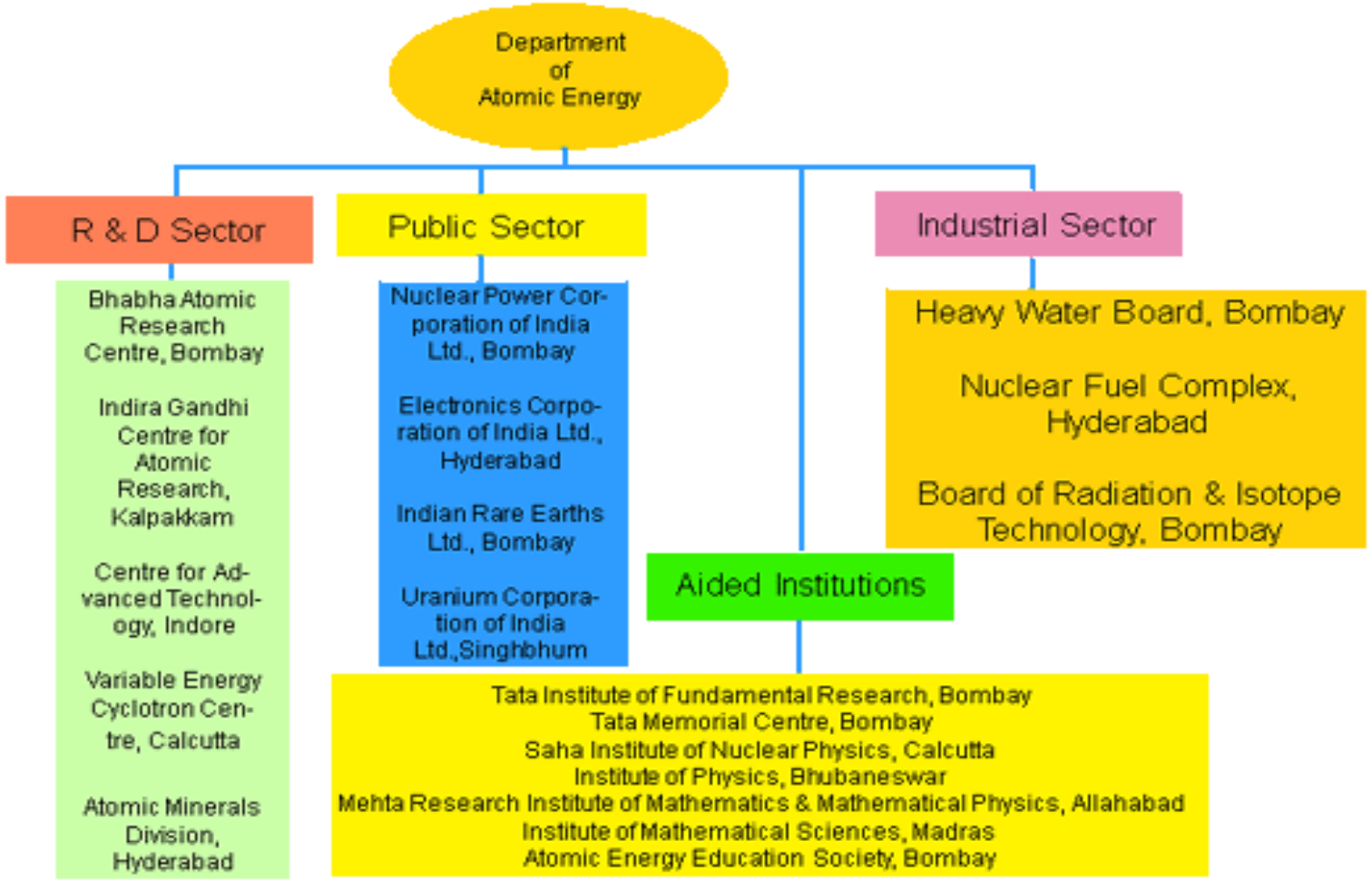
CSIR provides financial assistance to promote research work in the fields of Science & Technology, including Agriculture, Engineering and Medicine. The assistance is provided by way of grants to Professors in regular employment, in the universities, IITs, post-graduate institutions,Research proposals of applied nature as well as those falling under basic sciences which attempt to solve specific problems being pursued by CSIR laboratories, or in newer and complementary fields, are considered for CSIR support. Priority is given to multi-disciplinary projects which involve inter-organisational co-operation (including that of CSIR laboratories

You can Submit any Time of the Year : Budget : 12 Lakhs & 25 Lakhs(Tie up with CSIR Lab.)

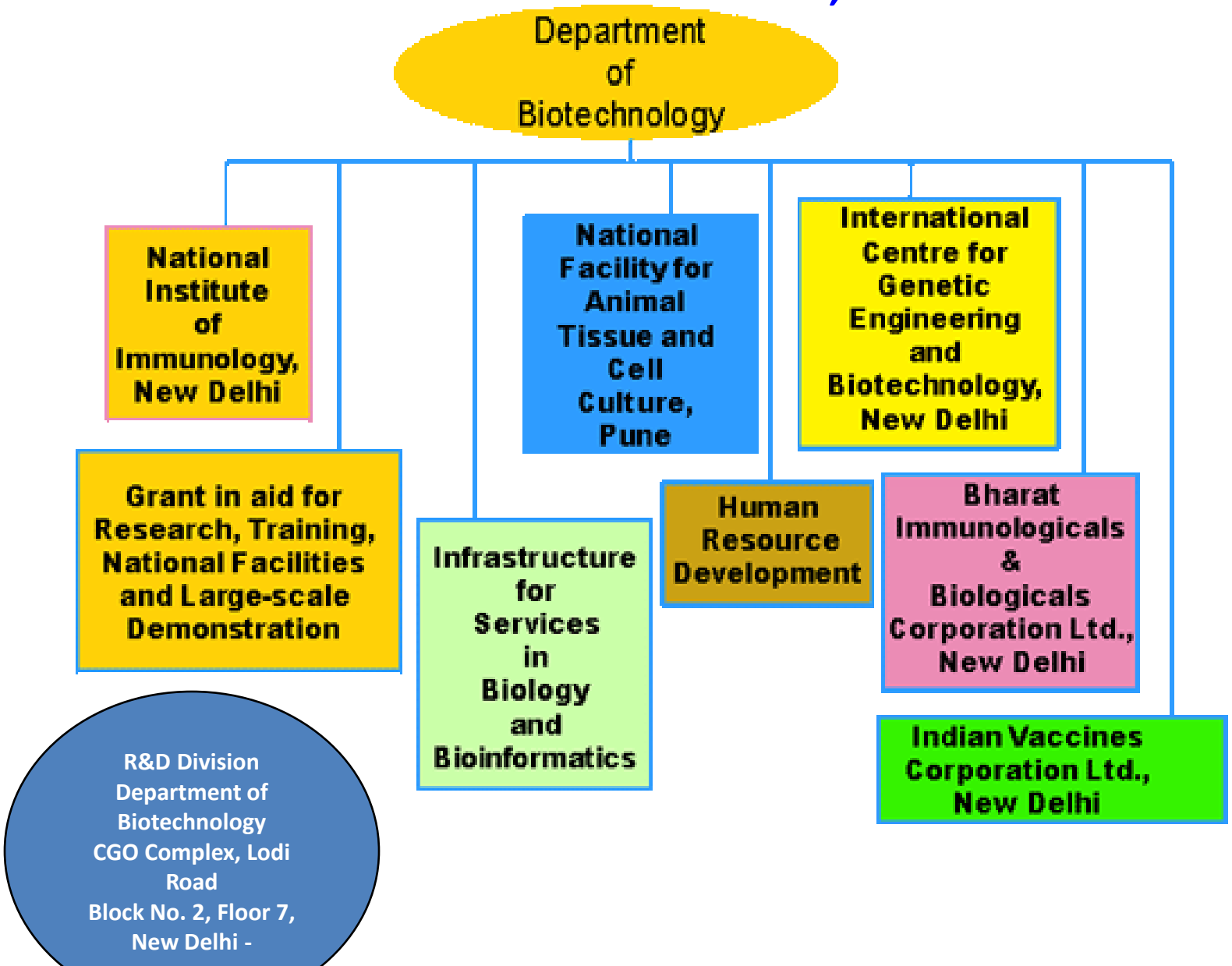
Head
Human Resource Development Group
CSIR Complex, Library Avenue, Pusa
New Delhi 110 012 India
Email : csircx@nda.vsnl.net.in
Fax : + 91 - 011 - 25720997
Tel : + 91 - 011 - 25748632 / 25721585

www.csirhrdg.res.in

DEPARTMENT OF ATOMIC ENERGY, GOVT. OF INDIA



DEPARTMENT OF BIOTECHNOLOGY, GOVT OF INDIA



UNIVERSITY GRANTS COMMISSION

Address

Bahadur Shah Zafar Marg

New Delhi – 110002

Web: www.ugc.ac.in

Chhattisgarh Council of Science and Technology

- **It supports R&D activities in Universities / Colleges/S & T Institutions in the form of Mini Research Projects.**
- **The broad disciplines under which the Mini Research Projects are sanctioned are as follows:**
  - **Chemical Sciences**
    i) Inorganic Chemistry. ii) Organic Chemistry. iii) Physical Chemistry.
  - **Earth & Atmospheric Sciences**
    i) Atmospheric Science ii) Earth Science
  - **Engineering Sciences**
    i) Chemical Engineering ii) Electrical, Electronics and Computer Engineering iii) Mechanical Engineering and Civil Engineering iv) Robotics and Manufacturing
  - **Life Sciences**
    i) Animal Sciences ii) Biophysics, Biochemistry and Molecular Biology iii) Health Sciences iv) Plant Sciences
  - **Mathematical Science**
    i) Mathematics & Statistics
  - **Physical Sciences**
    i) Condensed Matter Physics and Material Science ii) Laser, Optics, Atomic and Molecular Physics iii) Plasma, High Energy, Nuclear Physics, Astronomy & Nonlinear dynamics
  - **Social Sciences**
    i) Sociology ii) Economics

INDIAN COUNCIL OF MEDICAL RESEARCH

THRUST AREAS OF RESEARCH

- COMMUNICABLE DISEASES
  TRIBAL HEALTH
  REPRODUCTIVE & CHILD HEALTH
  NUTRITION
  NON-COMMUNICABLE DISEASES
  BASIC MEDICAL SCIENCES
  TRADITIONAL MEDICINE

Ministry of New and Renewable Energy

- The Ministry of New and Renewable Energy funds proposals from individual scientists working in Universities, institutes or industries for projects that provide innovative ideas for the generation of non-conventional energy sources such as biomass, biogas and bio-fuel.
- The proposals are screened and selected by an appraisal committee before being recommended for funding. Opportunities also exist for international collaborations in the above areas of research with scientists/organizations of several countries
- Support: Grant covers equipment, consumables, and travel.
- Deadline: varies
- Duration: Two-three years
- Address: Ministry of New and Renewable Energy, Block-14, CGO Complex, Lodhi Road, New Delhi-110 003
- Website: http://www.mnes.nic.in

Economics

- **Planning Commission, Govt. of India**
- **Bureau of Economics and Statistics, State gGvernment**
- **Research Unit for Livelihoods and Natural Resources (RULNR) is promoted by the Centre for Economic and Social Studies with financial support from the Jamshedji TATA Trust Mumbai for conducting theoretical and empirical research on human livelihoods and natural resources with an objective of creating a centre for excellence in this field.**
- **Government of India (Ministry of Human Resources Development through ICSSR)**
- **Ministries of Agriculture and Health and Family Welfare**
- **Government of States (Departments of Education and Finance)**
- **Reserve Bank of India (RBI).**

Library Science

- The National Social Science Documentation Centre (NASSDOC), a constituent unit of the (ICSSR).
- The primary objective of the NASSDOC is to provide library and information support services to social science researchers. It is considered to be one of the largest repositories of bibliographical databases in the area of social sciences.
- Grants-in-Aid to Bibliographical and Documentation Projects
- Under this scheme NASSDOC provides financial assistance to conduct research in the field of Library and Information Science and compilation of research/reference tools for social scientists.

DEPARTMENT OF ATOMIC ENERGY (DAE)

BOARD OF RESEARCH IN NUCLEAR SCIENCES (BRNS)

- ***BRNS - Board of Research in Nuclear Sciences - is an advisory body of the Department of Atomic Energy (DAE) to recommend financial assistance to universities/ institutions / laboratories with the objective to encourage and promote scientific research in areas of relevance to the mandate of the DAE.***

- **Scientific Secretary / Programme Officer**
- **Board of Research in Nuclear Sciences**
- **BRNS Secretariat, Central Complex**
- **Bhabha Atomic Research Centre, Trombay, Mumbai 400 085.**
- **http://www.barc.gov.in E Mail: brns@magnum.barc.gov.in**

- **. Applications received up to October 31 in any year will be considered for financial support in the next financial year.**

MINISTRY OF ENVIRONMENT AND FORESTS

–

- The Ministry of Environment and Forests is primarily concerned with the implementation of policies and programmes relating to conservation of the country's natural resources including lakes and rivers, its biodiversity, forests and wildlife, ensuring the welfare of its animals and prevention and abatement of pollution. While implementing these policies and programmes, the Ministry is guided by the principle of sustainable development and enhancement of human well-being. The Ministry also serves as the nodal agency in the country for the United Nations Environment Programme (UNEP), South Asia Cooperative Environment Programme (SACEP), International Centre for Integrated Mountain Development (ICIMOD) and for the follow-up of the United Nations' Conference on Environment and Development (UNCED). The Ministry is also entrusted with the issues relating to multilateral bodies such as the Commission on Sustainable Development (CSD), Global Environment Facility (GEF) and of regional bodies like Economic and Social Council for Asia and Pacific (ESCAP) and South Asian Association for Regional Cooperation (SAARC) on matters pertaining to environment.

- The main objectives of Ministry are conservation and survey of flora, fauna, forest and wildlife, prevention and control of pollution, afforestation and regeneration of degraded areas, protection of environment and ensuring the welfare of animals. These objectives are well supported by a set of legislative and regulatory measures aimed at the reservation and protection of environment. Beside these legislative measures, a National Conservation Strategy and Policy Statement on Environment and Development, 1992; National River Policy-1988, a Policy Statement on Abatement of Pollution-1992, and National Environment Policy-2006 have also been evolved. These objectives are sought to be fulfilled through environmental impact assessment, eco-regeneration, assistance to organisations implementing environmental and forestry research, education and training, dissemination of environmental information and international cooperation and creation of environmental awareness.

INDIAN SPACE RESEARCH ORGANIZATION, BANGALORE

- **Supported Areas of Research**

- **Space Science : Physics of the ionosphere and magnetosphere; meteorology, dynamics of the atmosphere; geophysics, geology; astronomy; cosmology; astrophysics; planetary and interplanetary space physics and climatology.**
- **Space technology : Rocket and satellite technology; propulsion systems design and optimization; aerodynamics and heat transfer problems related to space vehicles; guidance and control systems for launch vehicles and spacecraft; polymer chemistry, propellant technology; ultra-light-weight structure; satellite energy systems; space electronics, Space communication systems; orbital mechanics and computer sciences.**
- **Space Application : Remote sensing of the earth's resources: space communication; satellite geodesy image processing, satellite meteorology including weather forecasting, Space Education and** Ecology.

- **Scientific Secretary, ISRO, Government of India**
  Antariksh Bhavan
  New BEL Road
  Bangalore 560 094
  e-mail ID : scientificsecretary@isro.gov.in e-mail ID : msc@isro.gov.in
-
- **10)Total Budget Grants Provided For the RESPOND Programme : Rs.14.76 Cores (3 years) (UNIVERSITIES/ COLLEGES = 23 projects)**

INSA FELLOWSHIPS

- **Applications are invited for the following year from Indian citizens for the awards of INSA-Visiting Fellowship for conducting advanced research or undergoing specialized training of Indian Research Institutes/Laboratories.**

Details of Awards

- **These Fellowships will be awarded on a competitive basis to the scientists for furtherance of their research and/or research capabilities for carrying out collaborative research, undergoing training in specific techniques, or utilizing facilities not available in their own institutions. The Fellowship will be for a minimum period of one month to a maximum of 6 months in a laboratory or research institutions of his/her choice within India located in another city, other than his/her own place. Fellowships to be awarded each year will be a maximum of 120 man months per annum.**

Value

- **These fellowships will carry an honorarium of Rs.9000/-(taxable) and DA Rs.6000/- per month (@ Rs.200 per day x 30 days) in addition to the scientist's own salary from his parent institution. The Academy will provide to and fro travel expenses by 1st class or 2nd AC Sleeper from the parent organisation to the proposed institute of work on production of tickets**.

INSA FELLOWSHIPS

- **Applications will be invited once a year. The applicants would be required to provide a concise account of their plan of work/ study besides their bio-data highlighting their achievements. It would be desirable that the applicant should have approached the host institution and the scientist concerned to ascertain their concurrence to accept him/ her.**
- **The applicant should be a scientist and hold a regular position in any R & D organisation including Universities or Affiliated Colleges in India. The Scientists who have already availed INSA Visiting Fellowship would be eligible for consideration after the gaps of 5 years.**
- **Candidates should submit their application (Two Sets) on prescribed application form available in the Academy through proper channel to the Executive Secretary, Indian *National Science Academy, Bahadur Shah Zafar Marg, New Delhi - 110002. The decision of the Academy will be communicated during April / May in the following year***

Science Academies' Summer Research Fellowship Programme for Students and Teachers

- The three national Science Academies offer several two-month Summer Fellowships to enable students/teachers to work with scientists associated with the three Academies during 2012.
- Applications are invited from interested students and teachers from all universities and colleges affiliated to UGC/AICTE/MCI/Accredited Institutions of State Universities for these Fellowships. The online application should include: (a) Details of the applicant (fill in applicable and mandatory fields); (b) a write-up (in about 250 words) as to what the applicant wants to learn and achieve; (c) the guide with whom the applicant would like to work. A list of those who have consented to guide students/teachers to work on short-term projects is displayed at the end of the online application. Student applicants should forward a recommendation letter from a teacher (in the prescribed format) familiar with their work, in a sealed envelope. The selected candidate may work in consultation with the assigned guide for two months any time during the calendar year, preferably during the summer.

General Foreign or International Funding Agencies:

- American Academy in Rome
- **Association of Commonwealth Universities (ACU)**
- **Australian Bicentennial Scholarships**
- **Bradley Foundation Grant program**
- **British Council**
- **The British Institute in Eastern Africa**
- **Canon Foundation Fellowships**
- **Commonwealth Foundation**
- **CO-REACH Social Science Collaborative Research between Europe and China**
- **Daiwa Anglo-Japanese Foundation**
- **Earthwatch Institute**
- **Ford Foundation**
- **The Foundation for the Future**
- **Fulbright Commission**
- **Harry Frank Guggenheim Foundation**
- **Harry Ransom Humanities Research Center Research fellowships**
- **Horowitz Foundation for Social Policy**
- **International Federation of University Women**
- **Toyota Foundation American Academy in Rome**
- **Association of Commonwealth Universities (ACU)**
- **Australian Bicentennial Scholarships**

International Organisations

- United Nations Centre for Human Settlements (UNCHS)
- United Nations Food and Agricultural Organization (FAO)
- European Commission (EC)
- ICEF (India - Canadian Environment Facility)
- TWAS
- OECD/Hunger Campaign
- UNESCO
- DAAD
- JSPS
- Fullbright

Better Opportunities for Young Scientists in Chosen Areas of Science and Technology (BOYSCAST)

The scheme provides opportunities to Young Indian Scientists and Technologies (up to the age of 35 years), to interact with international scientist community and institutions and to participate in research and training activities in frontline areas of science and technology. The duration of the Fellowship is 3-12 months. Annually, on an average, about 40 young scientists are awarded this fellowship in various areas,

such as plant-microbe interactions; plant genetic resources; agricultural ecology; biodiversity and conservation biology; transplant biology; industrial microbiology; semiconductor physics; mathematical science; electronic material and processing; earth and atmospheric science; palaeoclimatology; organometallics; supramolecular chemistry; manufacturing engineering; computer and information science, earthquake engineering and structural dynamics.

The selected young scientist are also encouraged to attend scientific conferences and visit other institutions in the host country. Candidates selected under this scheme are expected to further generate and spread their expertise at the S&T laboratories/ Institutes across the nation.

INTERNATIONAL GRANTS :

TWAS's International Programme for Higher Education and Research (IPHER) provides some 250 fellowships tenable in developing countries such as Brazil, China and India for scientists from developing countries. Fellowships, which run for various lengths of time, are available for postgraduate, postdoctoral and advanced research. Brief details of each programme are provided below. For additional information, including eligibility criteria and application forms, please visit www.twas.org/Exchange. [US 10000] Chemistry, Physics, Maths, Biology

Fellowships office
Academy of Sciences for the Developing World (TWAS)
c/o ICTP
Strada Costiera 11
Trieste 34140 - Italy
Italy Tel.: +39 040 2240 314
Fax: +39 040 2240 689
Email: fellowships@twas.org

The closing dates for receipt of completed requests are: 1 July and 1 December

JSPS AND OTHER JAPANESE PROGRAM

- **MINISTRY OF SCIENCE AND TECHNOLOGY**
- **DEPARTMENT OF SCIENCE & TECHNOLOGY**
- **INDIA-JAPAN COOPERATIVE SCIENCE PROGRAMME (IJCSP)**
- ***www.jsps.gov.jp***

FULBRIGHT FELLOWSHIPS FOR USA

- **Fulbright-Nehru Visiting Lecturer Fellowships**

The visiting lecturer fellowships for four months are designed for Indian faculty, researchers and professionals from all disciplines. Priority fields are: Agricultural Sciences Economics Education Energy, Sustainable Development and Climate Change Environment International Relations Management and Leadership Development Media and Communications with focus on Public Service Broadcasting Public Administration Public Health Science and Technology Study of India with focus on contemporary issues and Study of the United States. For Study of India or the Study of the United States (American Studies) the areas could include: language and literature, history, government, economics, society and culture, religion, and film studies.

To Evaluate the Strengths, Weaknesses, Opportunities, and Threats

CONCLUSION

- The Future of Scientific Research in India is very Promising
- India has to its advantage the willingness to work with other countries in research and science development and lend its talents to the project
- The world is looking at India and hoping it continues to develop in the right direction so it can make the best use of some of the brightest talent in the world.

The moral of the story? First identify your core competency and then change the playing field to suit your core competency.

The moral of the story? It's good to be individually brilliant and to have strong core competencies; but unless you're able to work in a team and harness each other's core competencies, you'll always perform below par because there will always be situations at which you'll do poorly and someone else does well.

To sum up, the story of the hare and tortoise teaches us many things.

Important lessons are:

- that fast and consistent will always beat slow and steady;
- work to your competencies;
- pooling resources and working as a team will always beat individual performers;
- never give up when faced with failure;
- and finally, compete against the situation. Not against a rival.

In Short, BE STRATEGIC!

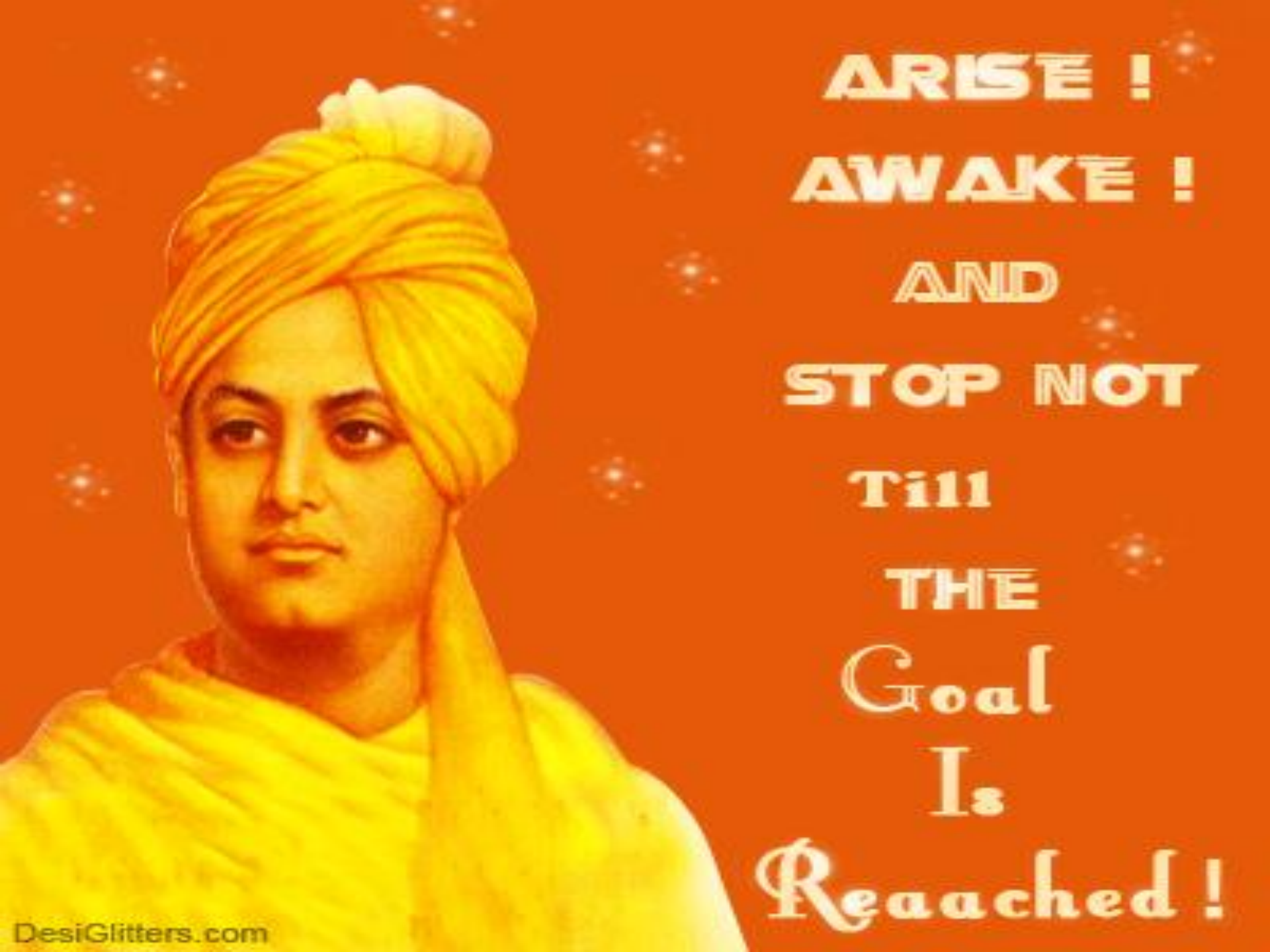
- **Impossible is a Word to be Found only in the Dictionary of Fools.**

  Napoleon Bonaparte

THIRD LAW OF THERMODYNAMICS

- **"Education is the Manifestation of the Perfection Already in Man"**

'Pursue Excellence, and Success will Follow."


ARISE !
AWAKE !
AND
STOP NOT
Till
THE
Goal
Is
Reaached !
DesiGlitters.com

Present Need of the Hour

1. Arise

2. Awake

3. Attend

4. Act

SPECIAL THANKS

Dr. Bijendra Pandey

Coordinator, Orientation Programme

Prof. B. K. SHARMA

Director, Academic Staff College

& ALL THE PARTICIPANTS

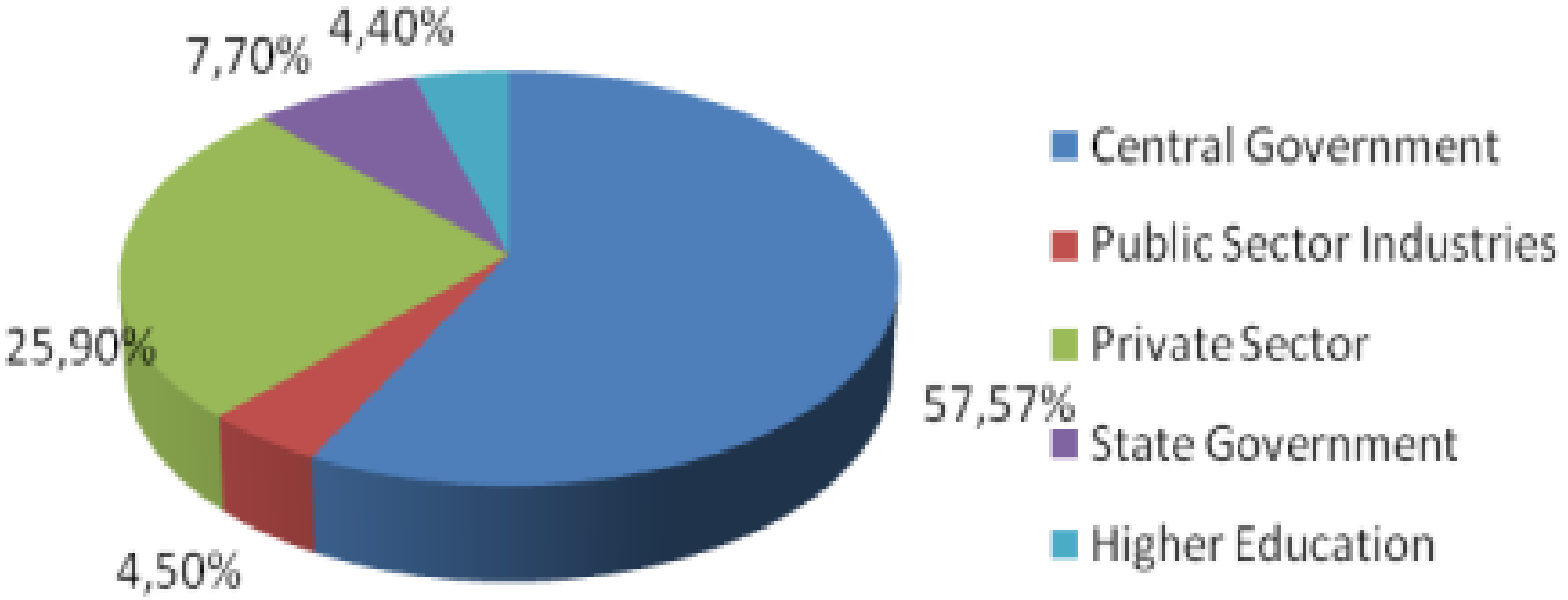
THANKS FOR YOUR ATTENTION

THANK YOU

I WISH THE ORIENTATION PROGRAMME A GRAND SUCCESS, & WISH ALL THE PARTICIPANTS A GOOD TIME IN

Pt. Ravishankar Shukla University

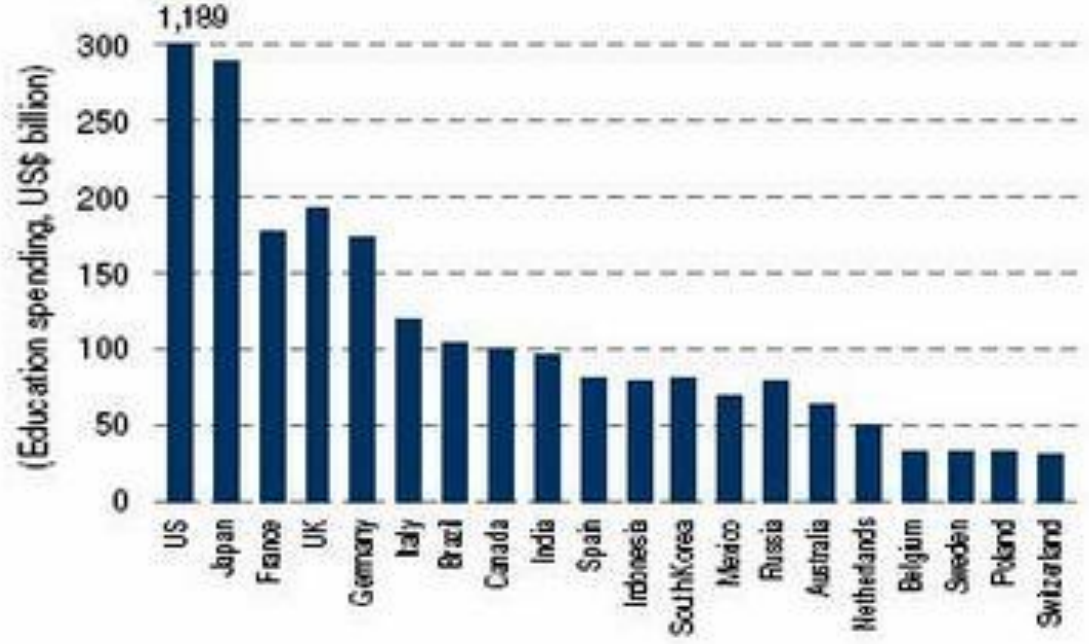
Sectorwise R&D Expenditure



Source of R&D Funds

	Industry	Government	Other	Funds From Abroad
Brazil	38.2%	60.2%	1.6%	0.0%
China	57.6%	33.4%	6.3%	2.7%
France	54.2%	36.9%	1.7%	7.2%
Germany	66.1%	31.1%	0.4%	2.3%
Hungary	30.7%	58.0%	0.4%	2.3%
INDIA	**23.0%**	**74.7%**	**2.3%**	**0.0%**
Israel	69.6%	24.7%	2.9%	2.8%
Japan	74.5%	17.7%	7.5%	0.3%
Korea	74.0%	23.9%	1.7%	0.4%
UK	43.9%	31.3%	5.4%	19.4%
U.S	**63.1%**	**31.2%**	**5.7%**	**0.0%**

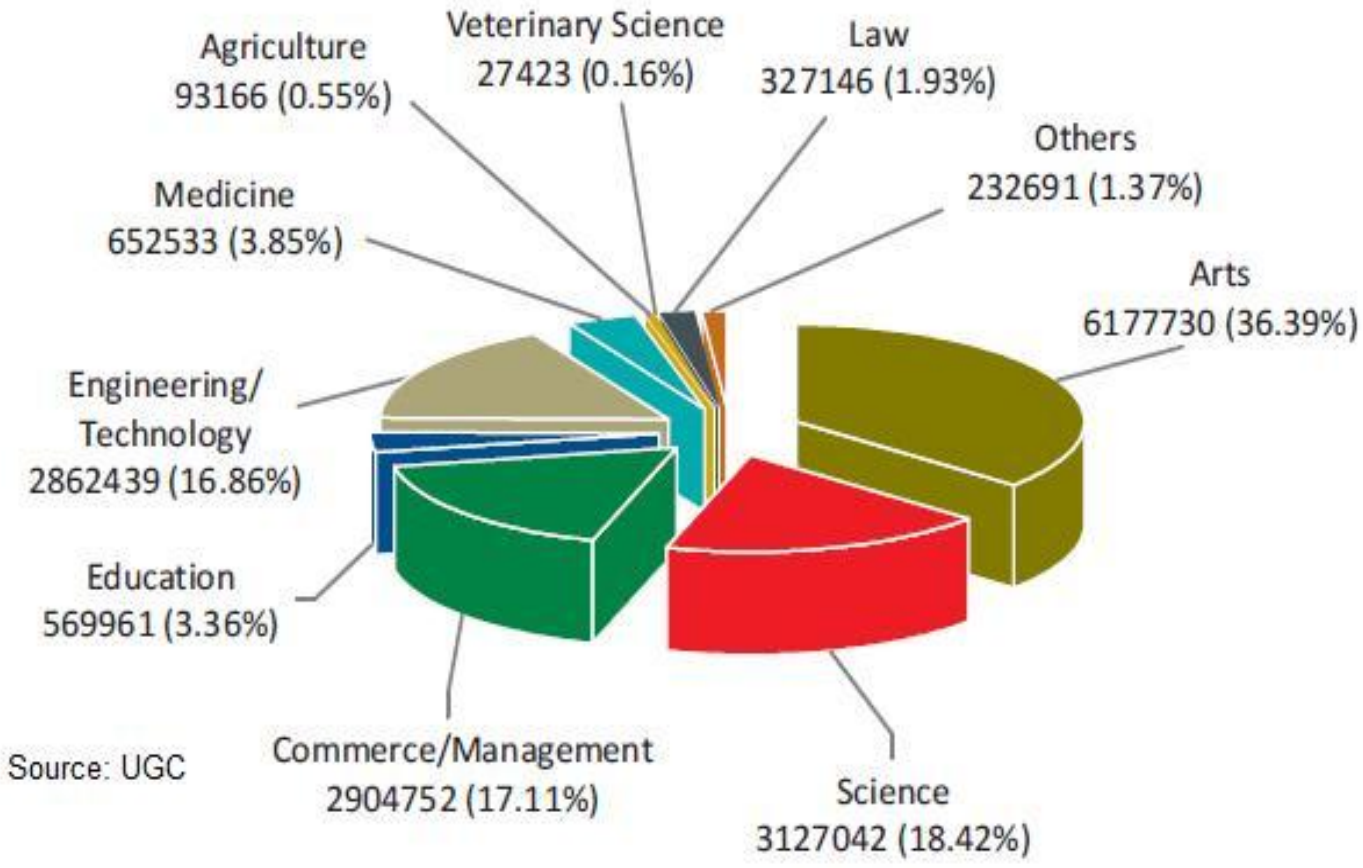
Fig 1 – India: among the top-10 markets by education spend



Source: World Bank and Anand Rathi Research

Note: Please see page 143 for the explanation of all references

Faculty-wise Students Enrolment in Higher Education 2010-11*



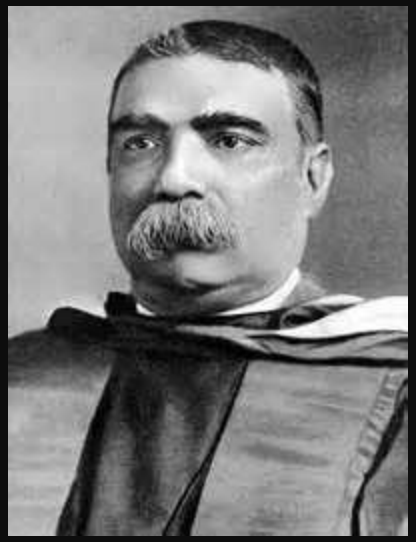
Source: UGC

Govt planning to offer 55 lakh package to Indian origin foreign faculty

- **Union Government has planned to offer an annual package of Rs 55 lakh ($1 lakh) to foreign faculty with Indian origin for leading science institutes. Government is planning to launch “brain-gain” policy which will be unveiled by Finance Minister, P Chidambaram in this year’s budget.**
- **The Department of Science and Technology (DST) and the planning commission has finalised the package to attract well known names from the world of science. Rs 15 crore will be allocated for the scheme in the department's budget for the financial year, 2013-14.**
- **“We want to hire at least 15 faculty members from best universities in the coming year. Role of the foreign faculty would not only be to teach but also to mentor the institutions in a bid to inculcate new concepts of science education and research,”..**
- **Initially, the package will be offered for a year and extendable by another four years.**

- “**Science for Shaping the Future of India**”.

Sir C. V. Raman was the first Indian scientist to be honoured with the prestigious Nobel Award in Physics in the year1930. Hence, the National Science Day holds great significance for Indian Science and scientific community.



- Original research at IACS was started in 1907 by C. V. Raman (1888-1970), then 19 years old . Raman came to Calcutta as Assistant Auditor General of Government of India and started working at IACS beyond office hours and on holidays.

- रामन सुबह साढ़े पाँच बजे परिषद की प्रयोगशाला में पहुँच जाते और पौने दस बजे आकर ऑफिस के लिए तैयार हो जाते। ऑफिस के बाद शाम पाँच बजे फिर प्रयोगशाला पहुँच जाते और रात दस बजे तक वहाँ काम करते। यहाँ तक की रविवार को भी सारा दिन वह प्रयोगशाला में अपने प्रयोगों में ही व्यस्त रहते। वर्षों तक उनकी यही दिनचर्या बनी रही।

Professor C V Raman received the **Nobel Prize** in Physics in 1930 for his work done from Indian Association for Cultivation of Science, Kolkata institute on the scattering of light and for the discovery of the effect named after him.

- **In 1917 he was offered the 'PALIT CHAIR' in Physics in Calcutta University by the then Vice Chancellor Sir Ashutosh Mukherjee.**

Prof. Godfrey Harold Hardy

He joined the Government college at Kumbakonam. He failed his F.A. exams miserably. (1904-1905)
He then joined Pachaippa's college at Madras where he would fail again on his F.A. exams. On his physiology exam, he would write: `` Sir, this is my undigested part of the Digestion chapter".(1906-1907)

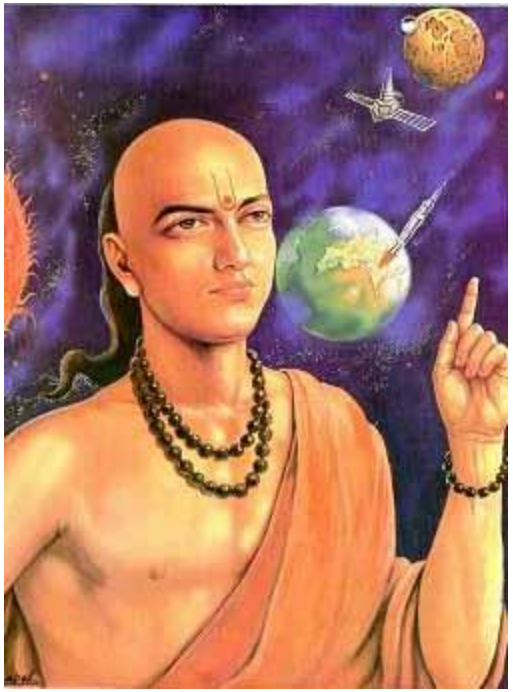
- 22nd December 1887

- 26th. April 1920
- **I discovered ----------**
- **But I did not invent him……**
- **He invented himself**
- **Prof. G.H. HARDY, Cambridge**

1887-1920

Ramanujan in Feb 24--1919, on his way back to India.

- **Here is a recent picture of the magnificent Trinity College in Cambridge where the great Newton himself had once worked and on whose hallowed grounds Ramanujan could now walk proudly as an insider. The same man had no chance whatever of getting into the Presidency College in Madras a few years earlier.**



Contribution of Mathematician-Aryabhatta & Bhaskaracharya in mathematics.

Why is it that in the second half of 20th century, we could not recreate the magic of the early part of the century created by Ramanujams, Ramans, Boses and so on?

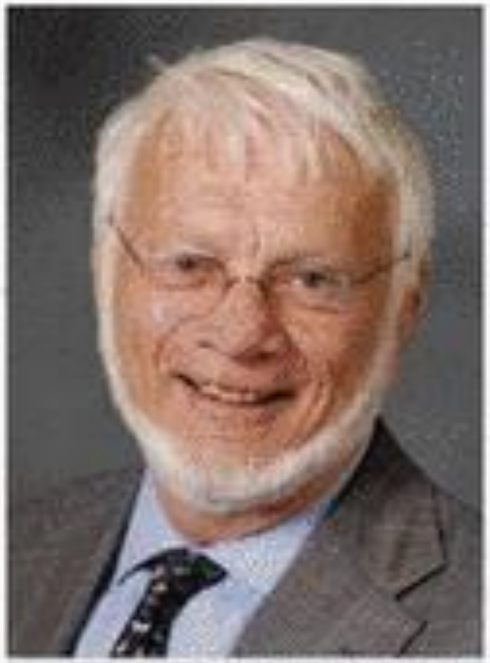
The potential Ramans and Ramanujams are there even today somewhere.

We need to find them early enough and nurture them. For this, we need to recognize that there is no intellectual democracy; elitism in science is inevitable and needs to be promoted.

Courtesy of International Union of Crystallography

Venkatraman Ramakrishnan

United Kingdom



Credits: Michael Marsland/Yale University

Thomas A. Steitz

USA

Credits: Micheline Pelletier/Corbis

Ada E. Yonath

Israel

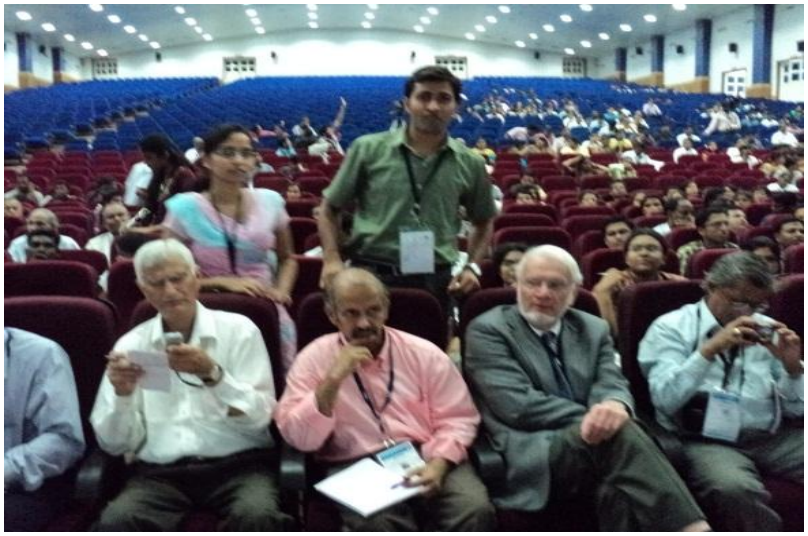
From Baroda to Cambridge- A Life in science

The three distinguished scientists have used the X-ray crystallography to detail the atomic structure of ribosomes and develop models to explain their association with various antibiotics. These models are now used for the development of new drugs. **NOBEL LAUREATES 2009**

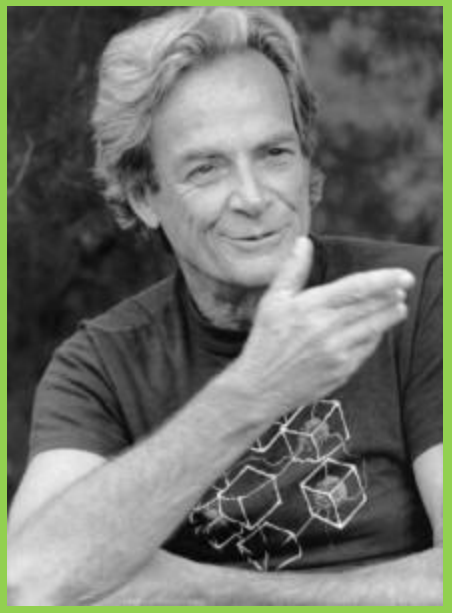
“Try, Try! Until you succeed”

He failed to get admitted to any of the Indian Institutes of Technology or the Christian Medical College, Vellore, Tamil Nadu. Immediately after graduation he moved to the U.S.A., where he obtained his PhD degree in Physics from Ohio University in 1976. He then spent two years studying biology as a graduate student at the University of California, San Diego while making a transition from theoretical physics to biology.After his post-doctoral fellowship, he initially could not find a faculty position even though he had applied to about 50 universities in the U.S.

Dr. Venkatraman Ramakrishnan



Prof. Thomas A. Steitz



Nobel Prize-winning and eccentric physicist Richard Feynman has been called a buffoon and a magician, but is lauded as a man who could make science accessible and interesting for all.

Stephen Hawking

What are the things you find most beautiful in science?
The universe is governed by science.
Science is beautiful when it makes simple explanations of phenomena or connections between different observations. Examples include the double helix in biology, and the fundamental equations of physics."

How I made it: CNR Rao, Scientist

Tips for success

Pursue your dreams with passion, hardwork and dedication.

Never stop learning. The thirst to gain more knowledge should never come to an end.

Always gain fresh insights, don't hesitate to ask the right questions.

Observe leaders closely, learn as much as you can from their leadership styles.

Build a strong base. The journey to peaks of excellence requires a strong base camp.

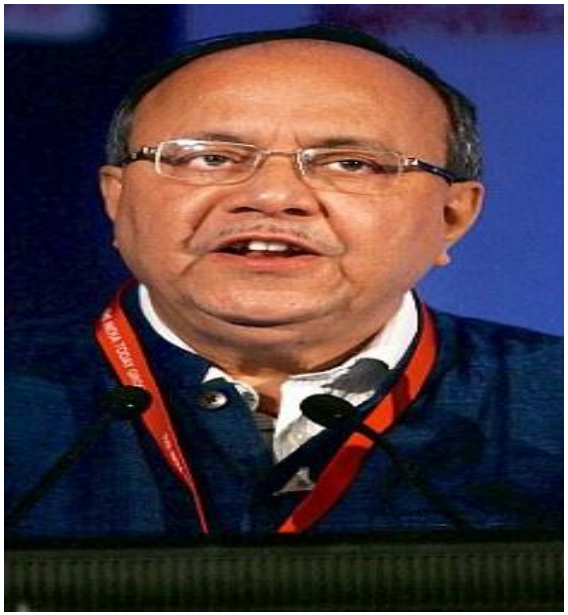
Keep a balance between professional and personal life. Find time for your family and the things which interest you.

Research Scholars (Mr. Rahul Sharma and Ms. Bhaushree Gupta) of Pt.RSU

“Future of Indian Science will Emerge from Smaller Towns”

T. Ramasami , Secretary, Department of Science and Technology, intreacting with students at the 'Dhi Yantra' a workshop on brain modelling and supercomputing in Chennai

The next generation of leaders in science and technology will emerge from remote parts of India, small towns and cities, and not necessarily from metro cities. Prof Samir Brahmachari, director general of Council of Scientific and Industrial Research (CSIR),



Prof.Brahmachari gained a B.Sc degree in chemistry from the University of Calcutta in 1972, followed by an M.Sc (Pure Chemistry) in 1974. In 1978 he earned a PhD in Molecular Biophysics from IISC in Bangalore

- 'In order to Achieve Leadership in New and Emerging areas of Scientific Research, India Needs a New crop of Scientists and Technologists who are trained in a **Multidisciplinary Fashion.**
-
- The Newly set up Academy of Scientific and Innovative Research (AcSIR) is Aiming to do just this.

We have discussed a lot, now it's time to act
Sam Pitroda, Advisor to Prime Minister

- So, when PM decided to set up Knowledge Commission rather than just Higher Education he wanted us to focus on knowledge as the next big paradigm for the 21st century. So, we started with focus on five aspects of knowledge, access to knowledge, knowledge concepts, knowledge creation, knowledge applications and knowledge services

OBJECTIVES

- **To Make learning of basic sciences**
- Exciting through excellent integrative teaching
- **Driven by Curiosity and Creativity**
- ***Entry into Research at an Early Age***
- A **Flexible Borderless Curriculum and Research Projects.**


2013 Global
R&D Funding Forecast

Robert J. Lefkowitz

Brian K. Kobilka

Robert J. Lefkowitz, of Duke University, and Brian K. Kobilka, of Stanford, are M.D.s, Medical Doctors, not the Ph.D.s who mainly populate the corridors of chemistry. Although medical doctors, both new Nobel laureates do have strong chemistry connections. Lefkowitz, for instance, is a professor of medicine and biochemistry. Kobilka's undergraduate degree is in both biology and chemistry .

- # 2012 NOBEL PRIZE IN CHEMISTRY: DID THE 'RIGHT' SCIENCE GETS ITS DUE ?

- It's importance is so all-pervasive that chemistry not only has broken down traditional barriers in science, but even risks losing its own identity.

Solve some of the Great Global Challenges.

Svante August Arrhenius

In 1884, based on this work, he submitted a 150-page dissertation on electrolytic conductivity to Uppsala for the doctorate. It did not impress the professors, among whom was Per Teodor Cleve, and he received a fourth class degree, but upon his defence it was reclassified as third class. Later, extensions of this very work would earn him the Nobel Prize in Chemistry

- **Arrhenius accepted a chemistry position at Technical High School of Stockholm. From this position he sent copies of his research to chemists in many of the laboratories of Europe. The older chemists formally and quietly rejected his thesis; they were firmly convinced that molecules could not break up and could not carry an electric charge. They, like the dissertation committee, could not imagine sodium, a metal that violently reacts with water, and chlorine, a gas with toxic properties, existing as independent tragments after sodium chloride dissolved in water.**

- **Remember Science is not just doing the Research, but it is also about your Knowledge that Disseminating stems from your Research.**

- *Innovation will be the key, if India needs to match up with global standards in R&D*

  Unfortunately, Indian scientists and researchers are more 'development-driven' rather than 'innovation-driven'.

The sparks generated by striking steel against a flint provide the activation energy to initiate combustion in this Bunsen burner. The blue flame will sustain itself after the sparks are extinguished because the continued combustion of the flame is now energetically favorable.

In chemistry, activation energy is a term introduced in 1889 by the Swedish scientist Svante Arrhenius that is defined as the energy that must be overcome in order for a chemical reaction to occur. Activation energy may also be defined as the minimum energy required to start a chemical reaction

BARRIER LESS CHEMICAL REACTIONS

- In some cases, rates of reaction *decrease* with increasing temperature. When following an approximately exponential relationship so the rate constant can still be fit to an Arrhenius expression, this results in a negative value of E_a. Elementary reactions exhibiting these negative activation energies are typically barrierless reactions
- NEGATIVE ACTIVATION ENERGY

- **The Dream is not what you see in sleep dream is which does not let you sleep.**
  Dream,Dream,Dream Dream transforms in to thoughts and thoughts result in action.
  You cannot change your future,But you can change your habits and surely your habits will change your future.

- **At present, India invests some US$12 billion annually on science and technology – about one-third of this coming from industry – or a total of about 1% of the gross domestic product (GDP). The new science policy aims to raise that figure to 2% of GDP by 2017 with active private participation.**

  A recent independent survey commissioned by the department of science and technology suggested diversifying research funding rather than concentrating on traditional areas of funding such as agriculture and tropical medicine.

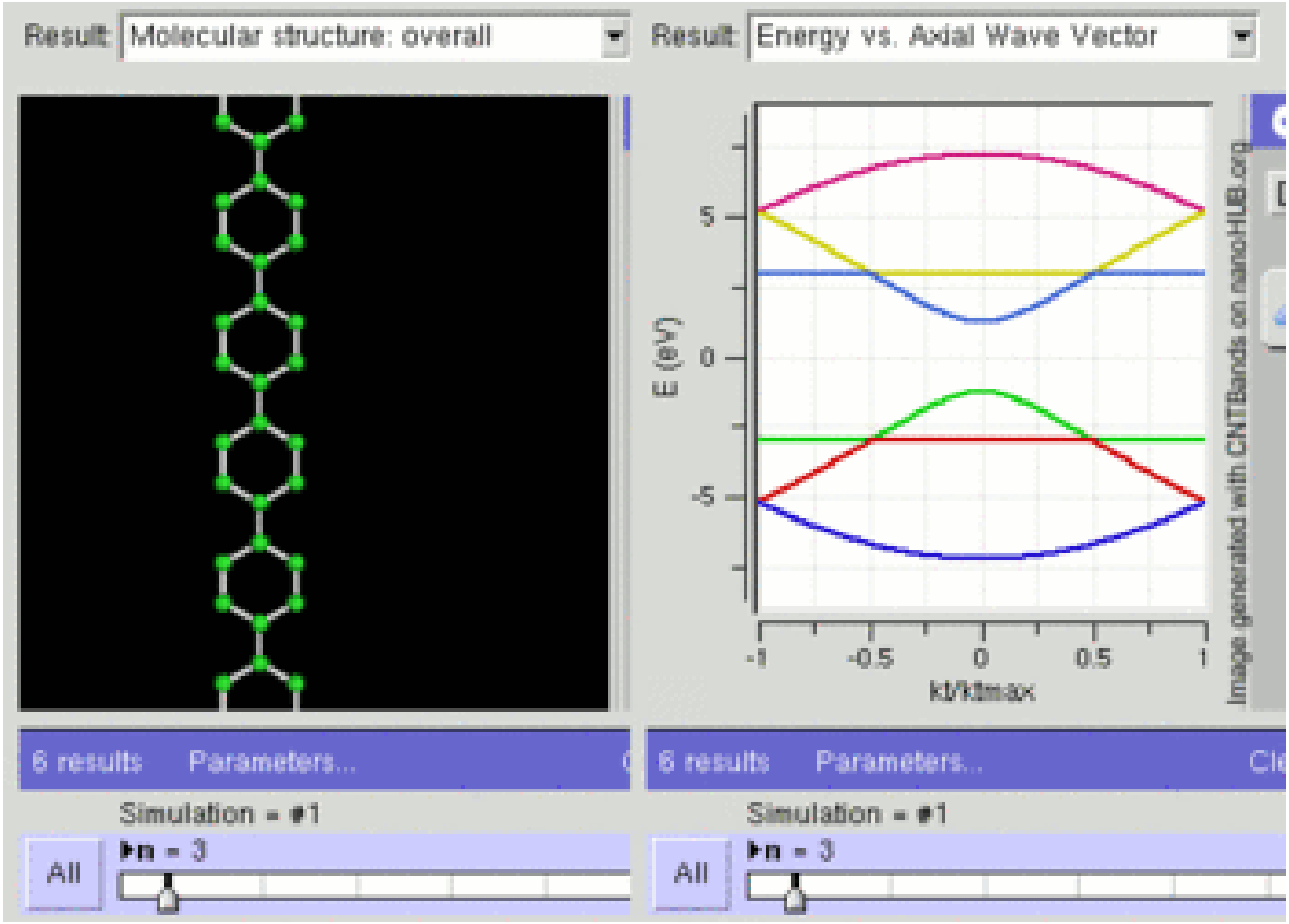
  The policy document identified critical areas for research and development including agriculture, telecommunications, energy, water management, drug discovery, material science including nanotechnology, climate change, and space technology. It also recommended a focus on interdisciplinary research.

Will Graphene replace silicon in electronics?

Will cars be fuelled by hydrogen stored in metal-organic frameworks (MOFs)?

Will stem cells grown on nano-fibrous scaffolds make organ replacement routine?

The fact that we can pose these questions says something about recent advances in science and technology, the study says.


Result: Molecular structure: overall
Result: Energy vs. Axial Wave Vector
E (eV)
5
0
-5
-1
-0.5
0
0.5
1
k/kmax
Image generated with CNTBands on nanoHUB.org
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Parameters...
Simulation = #1
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Simulation = #1
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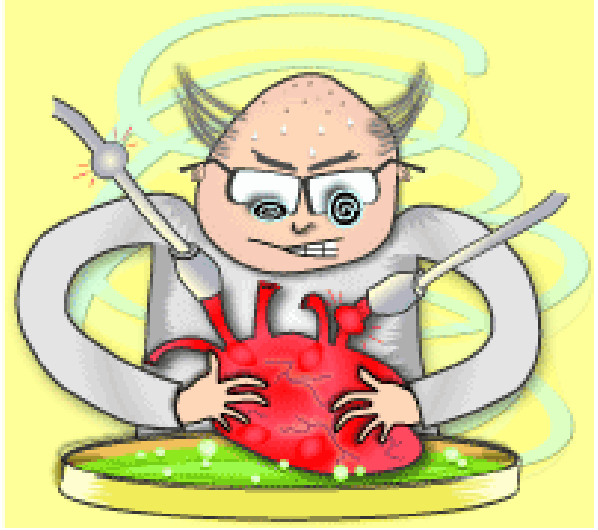
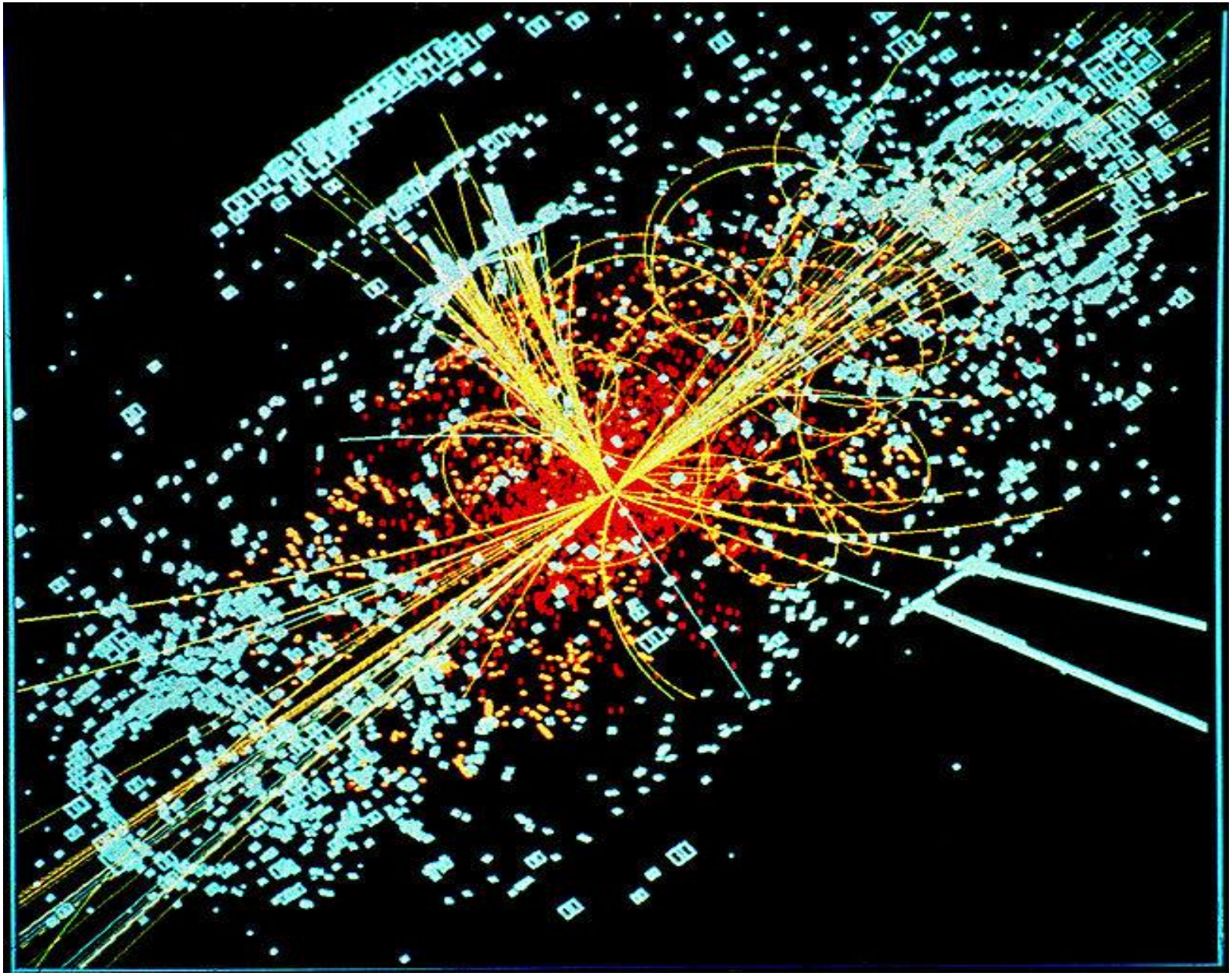


"I heard that scientists are growing human organs in lab dishes."

"Is this true?"

Is it possible to grow a replacement organ from stem cells in the lab, like growing a plant from a seed? Let's consider all of the things you would need to make an organ - say, a kidney - in a lab dish.

First, you need to obtain a type of stem cell that can ultimately become a kidney. Would this be an embryonic stem cell? A fetal stem cell? Will an adult stem cell do the job? How do you know? Where will you get the cells?



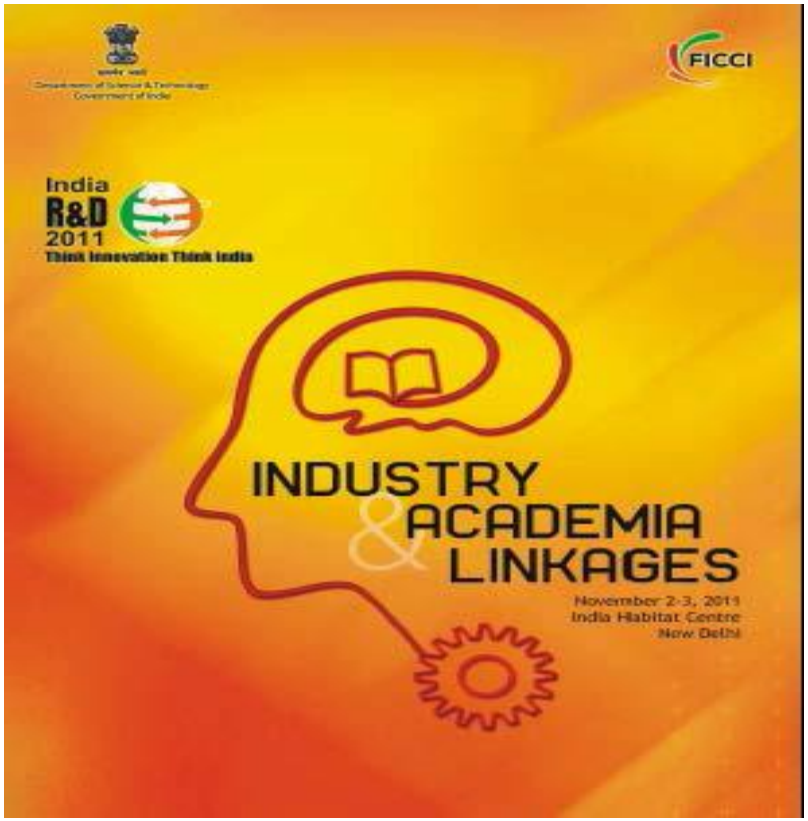
Developed in the 1960s by the U.S., Agent-15, or 3-Quinuclidinyl Benzilate, is one of the most hallucinogenic chemical warfare compounds ever developed.
An odourless, colourless incapacitating agent it can be absorbed into the central nervous system through respiration, ingestion, or through skin contact.

Syria used chemical weapons in Homs, US state department cables reveal
Evidence of Syrian army's use of chemical weapons 'compelling'
Leaked report suggests 'Agent 15' was used on Dec 23 in Homs

Global average temperatures have been rising in recent years, but not as much as they might have, thanks to a series of small-to-moderate-sized volcanic eruptions that have spewed sunlight-blocking particles high into the atmosphere. That's the conclusion of a new study, which also finds that microscopic particles derived from industrial smokestacks have done little to cool the globe.

Between 2000 and 2010, the average atmospheric concentration of carbon dioxide -- a planet-warming greenhouse gas -- rose more than 5 percent, from about 370 parts per million to nearly 390 parts per million. If that uptick were the only factor driving climate change during the period, global average temperature would have risen about 0.2°C, says Ryan Neely III, an atmospheric scientist at the University of Colorado, Boulder. But a surge in the concentration of light-scattering particles in the stratosphere countered as much as 25 percent of that potential temperature increase, he notes.

AcSIR Academy of Scientific & Innovative Research


Department of Science & Technology
Government of India
FICCI
India
R&D
2011
Think Innovation Think India
INDUSTRY
& ACADEMIA
LINKAGES
November 2-3, 2011
India Habitat Centre
New Delhi

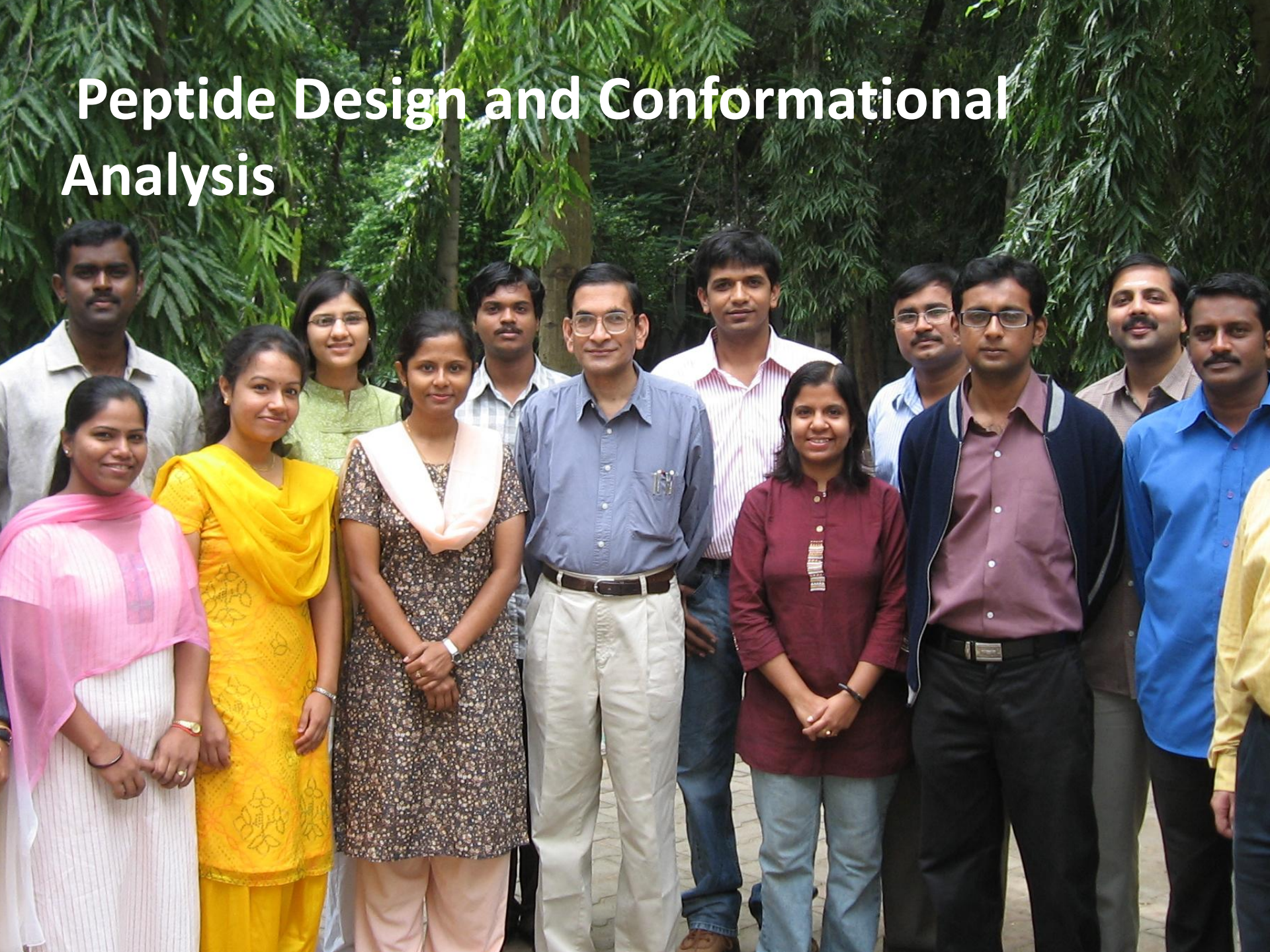
Biotechnology Industry Research Assistance Council

(A Govt. of India Enterprise)

Set up by Department of Biotechnology, Ministry of Science & Technology, Govt. of India


EDITOR
CURRENT SCIENCE

Peptide Design and Conformational Analysis



Prof. Sourabh Pal, NCL, Pune

ELECTRONIC STRUCTURE THEORY GROUP, MOLECULAR DYNAMICS

Professor K. N. GANESH, Director, Indian Institute of Science Education & Research (IISER) Pune, India

- **Introduction to Nanobioscience - Concepts and Tools:**

- **Nano DNA - From Molecular Assembles to Materials and Devices:**

- **Professor Kankan Bhattacharya, IACS, Kolkata**
- **Solvation dynamics Femtosecond Up-conversion Energy Transfer (FRET) Picosecond single photon counting Proton/Electron Transfer Confocal microscope and fluorescence life time imaging Anisotropy decay Surface Second harmonic generation Proteins**, micelles, lipid, cyclodextrin, polymer

Professor T. Pradeep , DST unit of Nanoscience
Department of Chemistry
Indian Institute of Technology Madras

- Nanomaterials, clusters, monolayers, electron spectroscopy and electronic structure, tandem mass spectrometry and ion/surface collisions, instrumentation

- **The cell is the unit of life. It is composed of nanosized building blocks (biomolecules such as lipids, proteins, DNA etc.) that are typically thousand times smaller than the complete structure of the cell. The investigation of the processes in a cell at the scale of the building blocks (2-50 nm) is providing new insights on the mechanisms oflife.**

Tata Institute of Fundamental Research
टाटा मूलभूत अनुसंधान संस्थान

Major Research Facilities in the Department

National Facility for High-Field NMR which consists of a 500 MHz wide bore (Bruker) and a 600 MHz (Varian) FT-NMR Instruments. This facility not only serves the members of the Institute but also supports scientists from different research laboratories all over the Country.

Other Facilities in the Department include:

Time-resolved Fluorescence Facility, MALDI-TOF, ESI-LCMS, Circular Dichroism Spectrometer, Stopped-flow Spectrometer, Laser T-Jump, Isothermal Titration Calorimetry, Differential Scanning Calorimetry, FPLC & Gradifrac, Time-resolved ESR, Molecular Beam Setup, Multi-photon Fluorescence Microscopy, Fluorescence Correlation Spectroscopy etc.

- **FIRST LAW OF THERMODYNAMICS**
- *(NUCLEAR ENERGY CONVERTED INTO ELECTRICAL ENERGY)*
- **METABOLIC ENERGY**
- **ENERGY FOR LIFE**

Second Law of Thermodynamics

- The disorder (entropy) in the universe is continuously increasing.
  - Energy transformations proceed spontaneously to convert matter from a more ordered, less stable form, to a less ordered, more stable form
  - Spontaneous changes that do not require outside energy increase the entropy, or disorder, of the universe
  - For a process to occur without energy input, it must increase the entropy of the universe

CONCLUSION

- The Future of Scientific Research in India is very Promising
- India has to its advantage the willingness to work with other countries in research and science development and lend its talents to the project
- The world is looking at India and hoping it continues to develop in the right direction so it can make the best use of some of the brightest talent in the world.

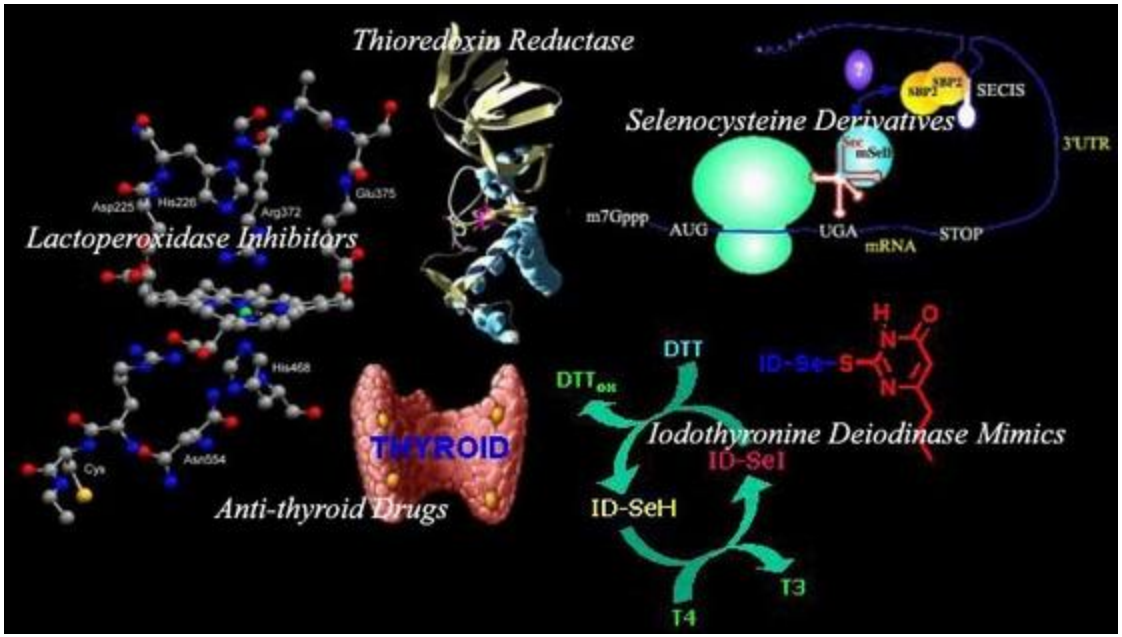
Present Need of the Hour

1. Arise

2. Awake

3. Attend

4. Act

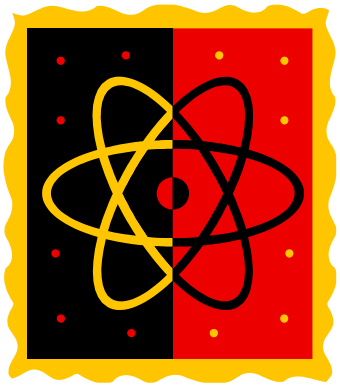


Chemistry in Thyroid Gland: Thyroid Hormones and Antithyroid Drugs

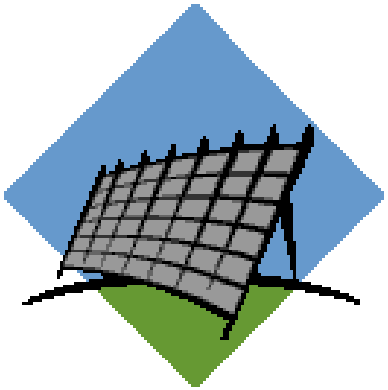
Antioxidant Activity of Organosulfur and Selenium Compounds

Chemical Biology of Zinc Proteins

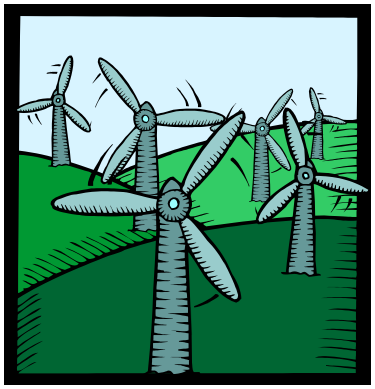
Non-polluting Energy sources



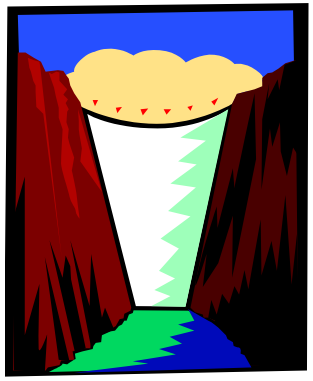
Nuclear



Solar



Wind



Water

Geothermal

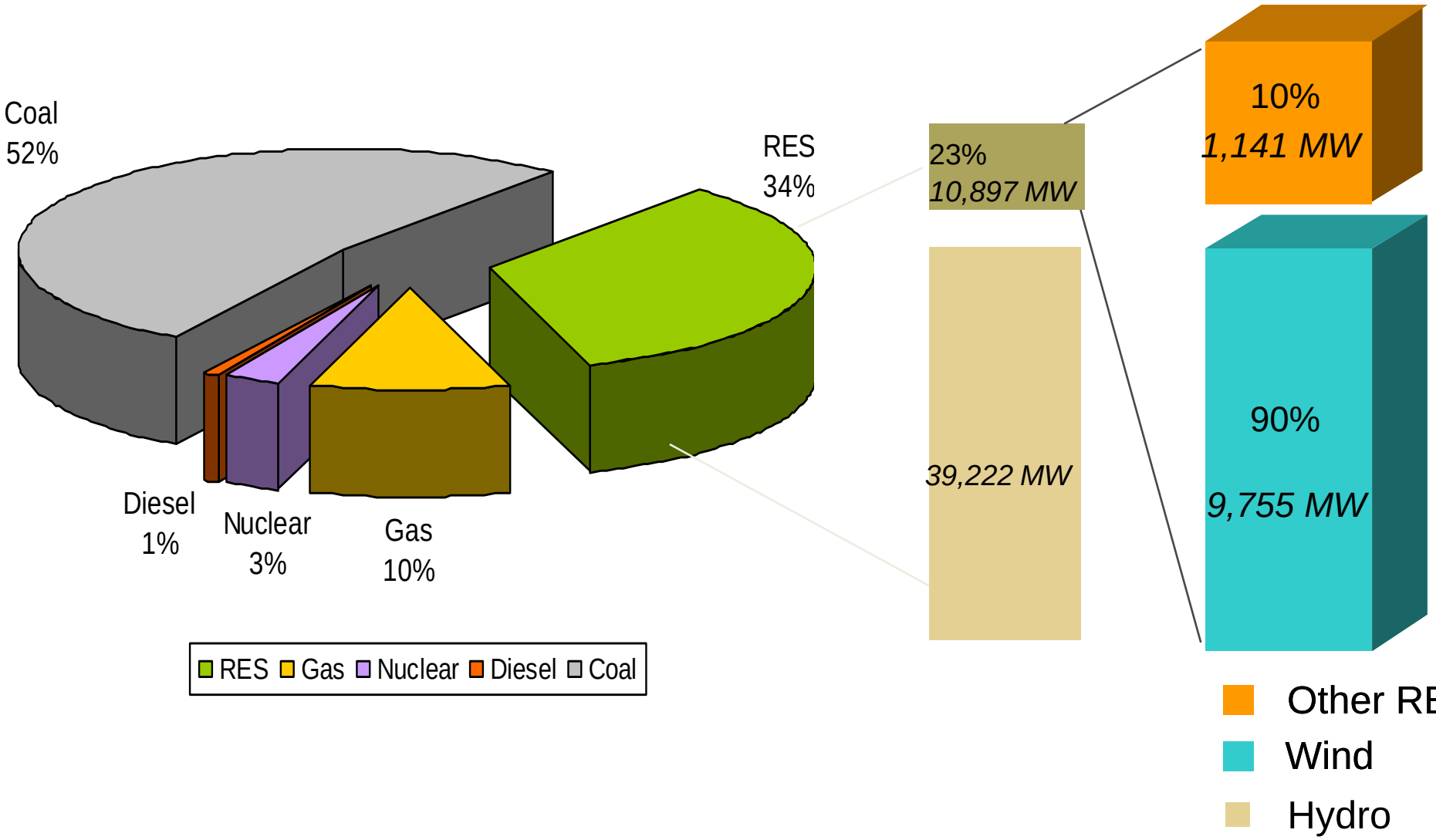
Message of Dr. Abdul Kalam

- **Cut down energy losses**
- **Utilize technologies to provide a diverse supply of environmentally friendly energy**
- **"We must achieve Energy Independence by 2030", including a cut down in ALL sectors**
- **Increase the power generated through renewable energy sources from 5% to 25%**
- **This is the nation's "first and highest priority"**

Dr. A.P.J. Abdul Kalam

(Rocket Scientist)

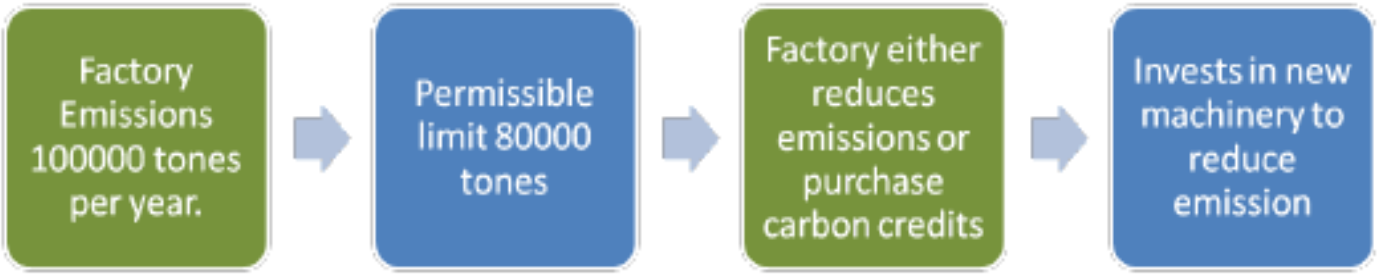
Electricity fuel mix



Indian energy sector: an overview

- Economic Growth and Human Development
- . There is a strong two-way relationship between economic development and energy consumption.
- On one hand, growth of an economy, with its global competitiveness, hinges on the availability of cost-effective and Environmentally Benign Energy Sources

HOW BUYING CARBON CREDITS CAN REDUCE EMISSIONS ??



Sustainable Energy

Energy is central to sustainable development and poverty reduction efforts.

It affects all aspects of development -- social, economic, and environmental -- including livelihoods, access to water, agricultural productivity, health, population levels, education, and gender-related issues.

None of the Millennium Development Goals (MDGs) can be met without major improvement in the quality and quantity of energy services in developing countries.

GLOBAL CLIMATE DISRUPTION

- **There is a scientific consensus that human activities are very likely to affect ENVIRONMENT**

GREEN HOUSE GASES

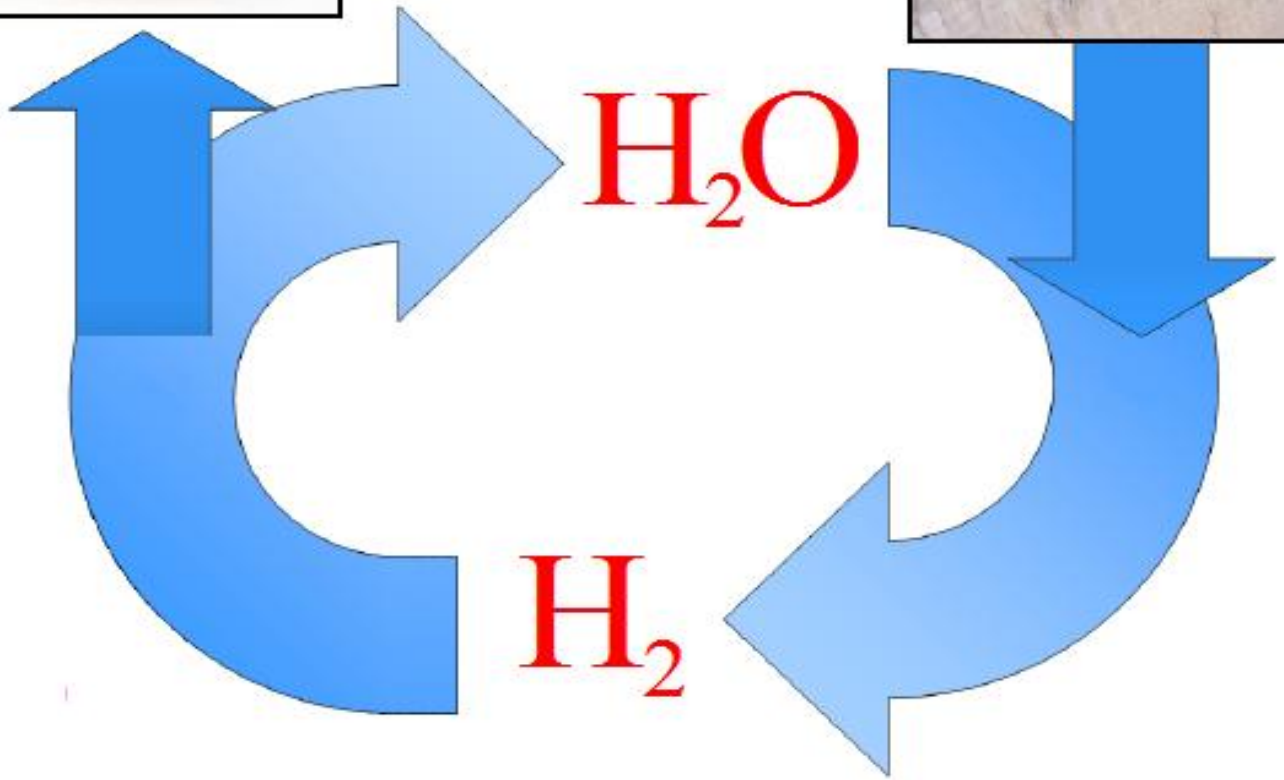
PRSU, SOS CHEMISTRY IS WELL KNOWN FOR ENVIRONMENTAL STUDIES

According to satellite data, a measure of the light-scattering ability of the stratospheric particles, called aerosols, rose on average between 4 percent and 7 percent each year between 2000 and 2010. (The more incoming sunlight is scattered back into space, the stronger the cooling effect.) But researchers have strongly debated the source of those aerosols, Neely says. While many teams have suggested that the aerosols came from small-to-mid-sized volcanic eruptions, a few others have proposed that they originated in Asian smokestacks. Their rationale: Emissions of sulfur dioxide in India and China grew about 60 percent during the decade, and atmospheric convection associated with the region's summer monsoon provides a way for watery droplets containing that gas to reach the stratosphere then diffuse around the world.

Perhaps the single biggest factor that motivates faculty in the US to compete vigorously for research grants is the provision of a 'summer salary' in these grants. The yearly compensation of faculty in the US is for nine months, allowing faculty to earn up to three months' salary from research projects. In other words, a faculty member can earn up to one-third more in a year through research grants.

This is a brilliant policy which creates a huge incentive for faculty to get grants, and then to deliver the research output promised in order to secure grants in future as well. And it keeps the incentive limited, preventing it from being entirely money oriented, since a faculty member can only earn some fraction of his salary even if he has a multimillion-dollar grant

Hydrogen as a Transportation Fuel

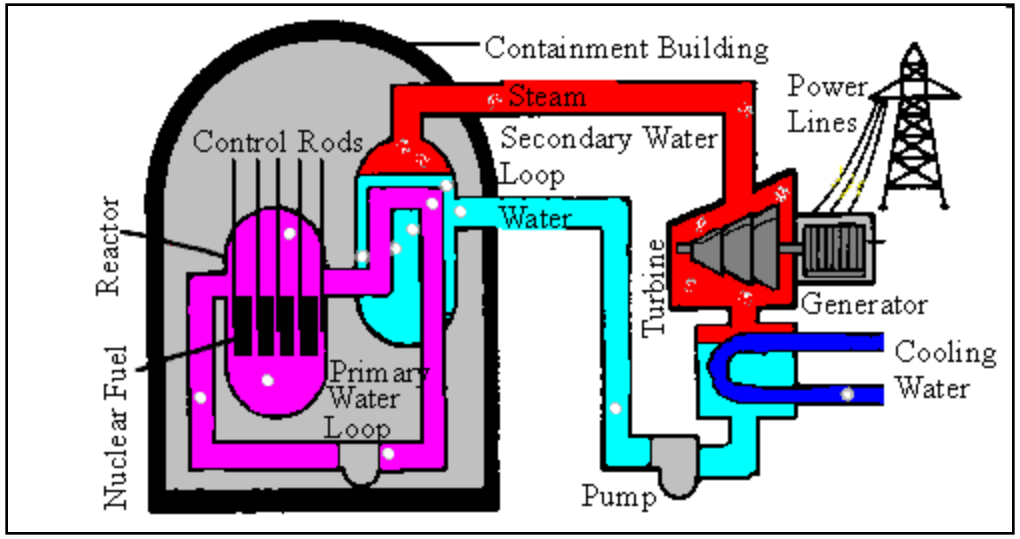


“We are committed to increasing energy efficiency and the share of renewable, including solar and nuclear power, in our energy mix. There will be large business opportunities and I am aware of Korean capabilities in environmentally friendly technologies,” Mr. Singh said in a speech to Korean CEOs Monday during his visit to Seoul for a summit on atomic safety. March 2012

The “power-hungry” India needs clean energy

Nuclear Energy

- **Earliest use = weapon**
- Nuclear Reaction Creates Heat

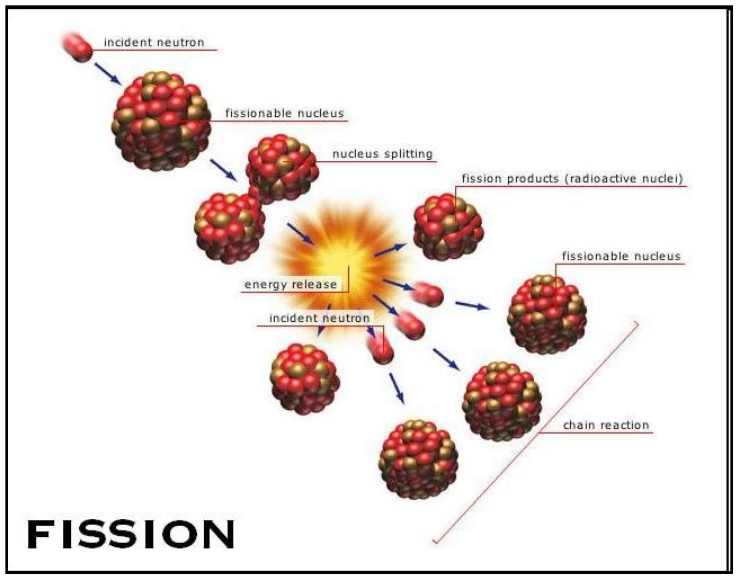


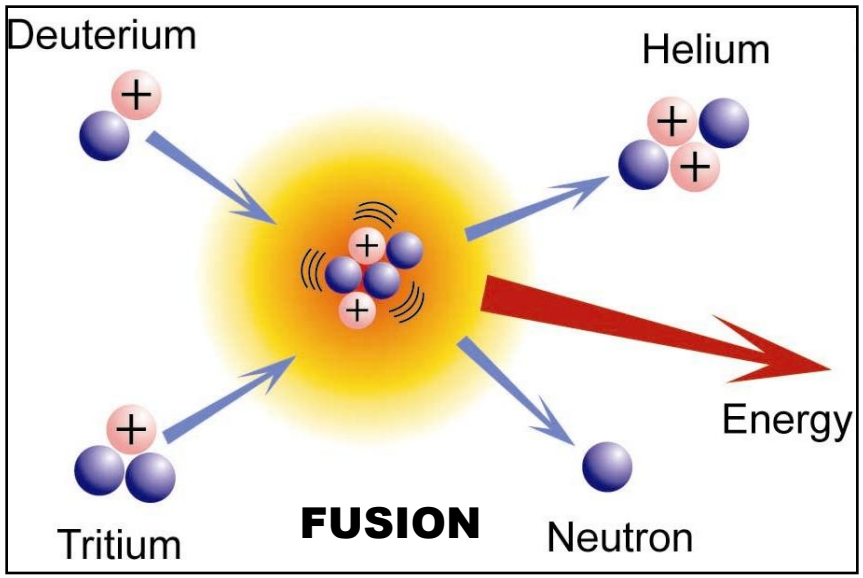
The day is celebrated to honour the Sir C.V. Raman for his invention of the 'Raman effect' on 28th February 1928.

- Whole nation takes the honour of thanking all the scientists for their remarkable contributions and dedication on this occasion.
- The day attracts many young minds and motivates them to take up science as their career.
- It is celebrated by showcasing country's competence in the field of science.

Nuclear Reactions

- **Fission = Splitting of Atoms; Primary Method for Nuclear Energy Use**
- **Fusion = Joining Atomic Nuclei to Make Heavier Atoms, Releases E xcess Matter as Energy**

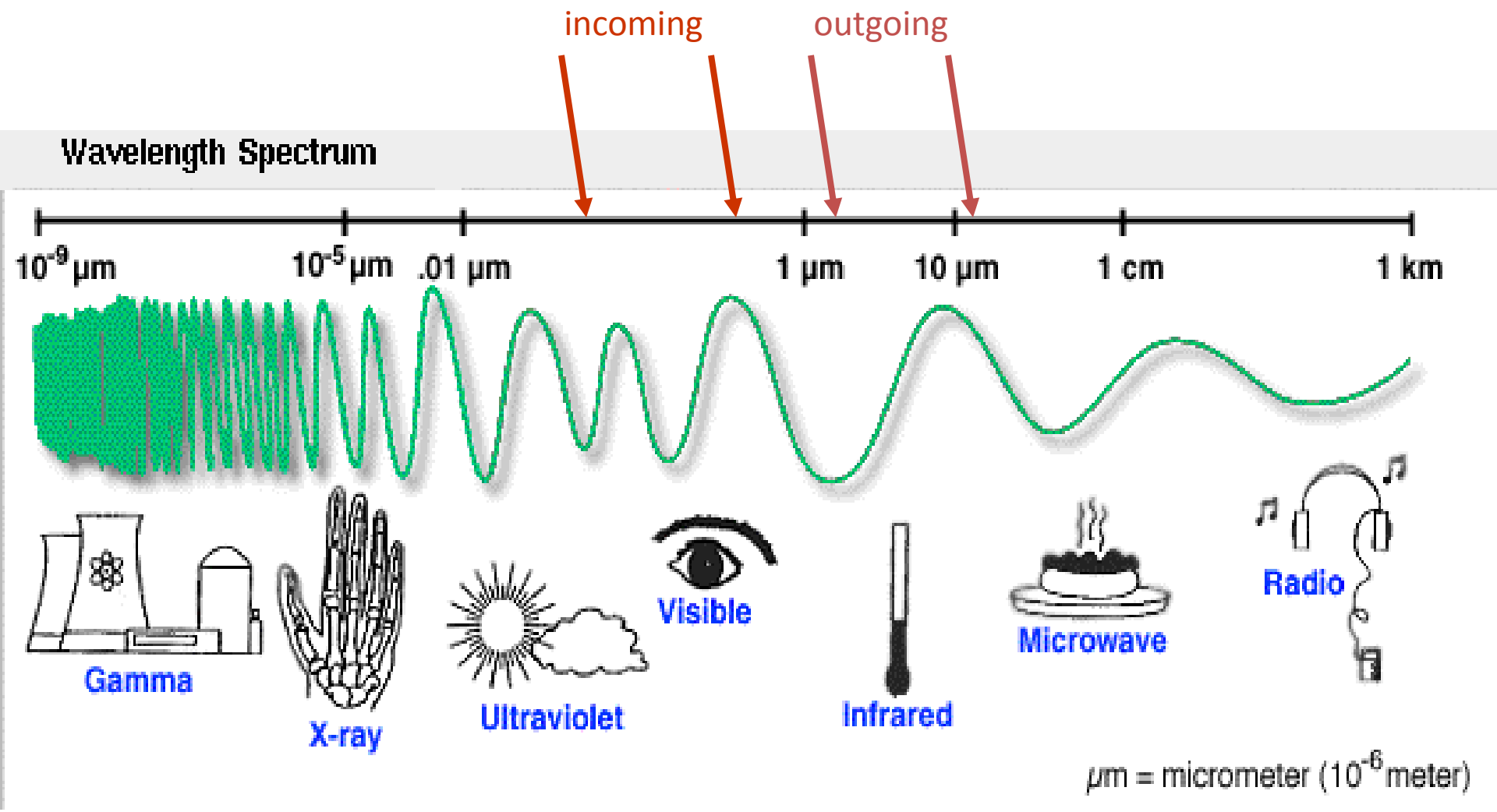




•CARBON EMISSIONS & NUCLEAR POWER

We are committed to a global reduction of CO2

Electromagnetic Spectrum

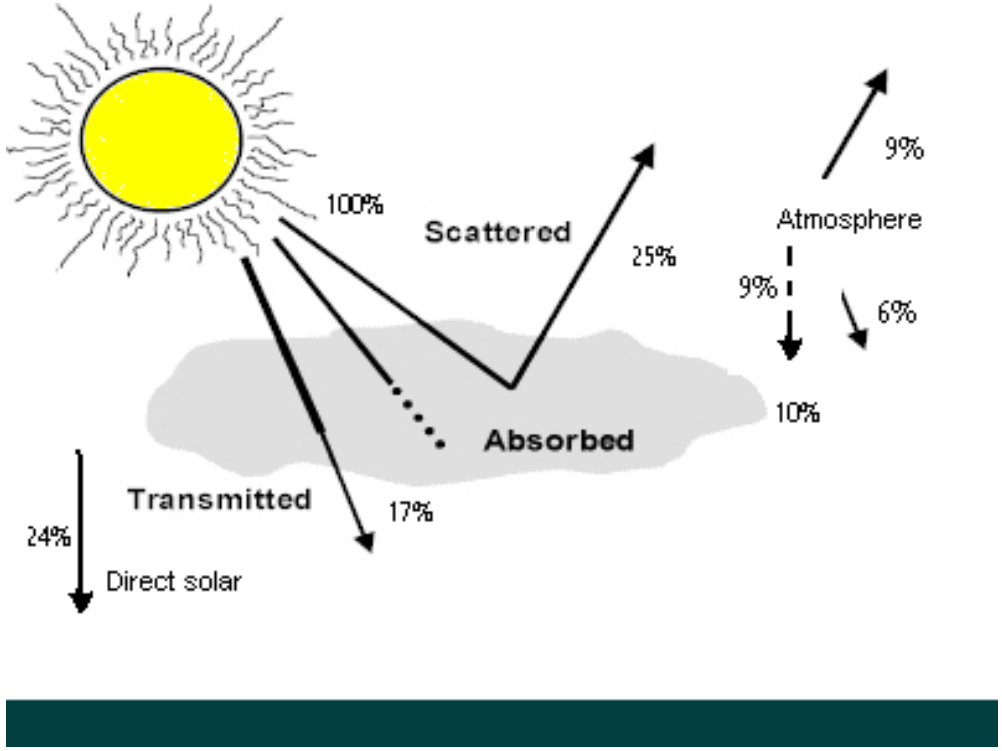


Advantages and Disadvantages

- Advantages
  - All chemical and radioactive polluting byproducts of the thermonuclear reactions remain behind on the sun, while only pure radiant energy reaches the Earth.
  - Energy reaching the earth is incredible. By one calculation, 30 days of sunshine striking the Earth have the energy equivalent of the total of all the planet's fossil fuels, both used and unused!
- Disadvantages
  - Sun does not shine consistently.
  - Solar energy is a diffuse source. To harness it, we must concentrate it into an amount and form that we can use, such as heat and electricity.
  - Addressed by approaching the problem through:

    1) collection, 2) conversion, 3) storage.

How much solar energy?

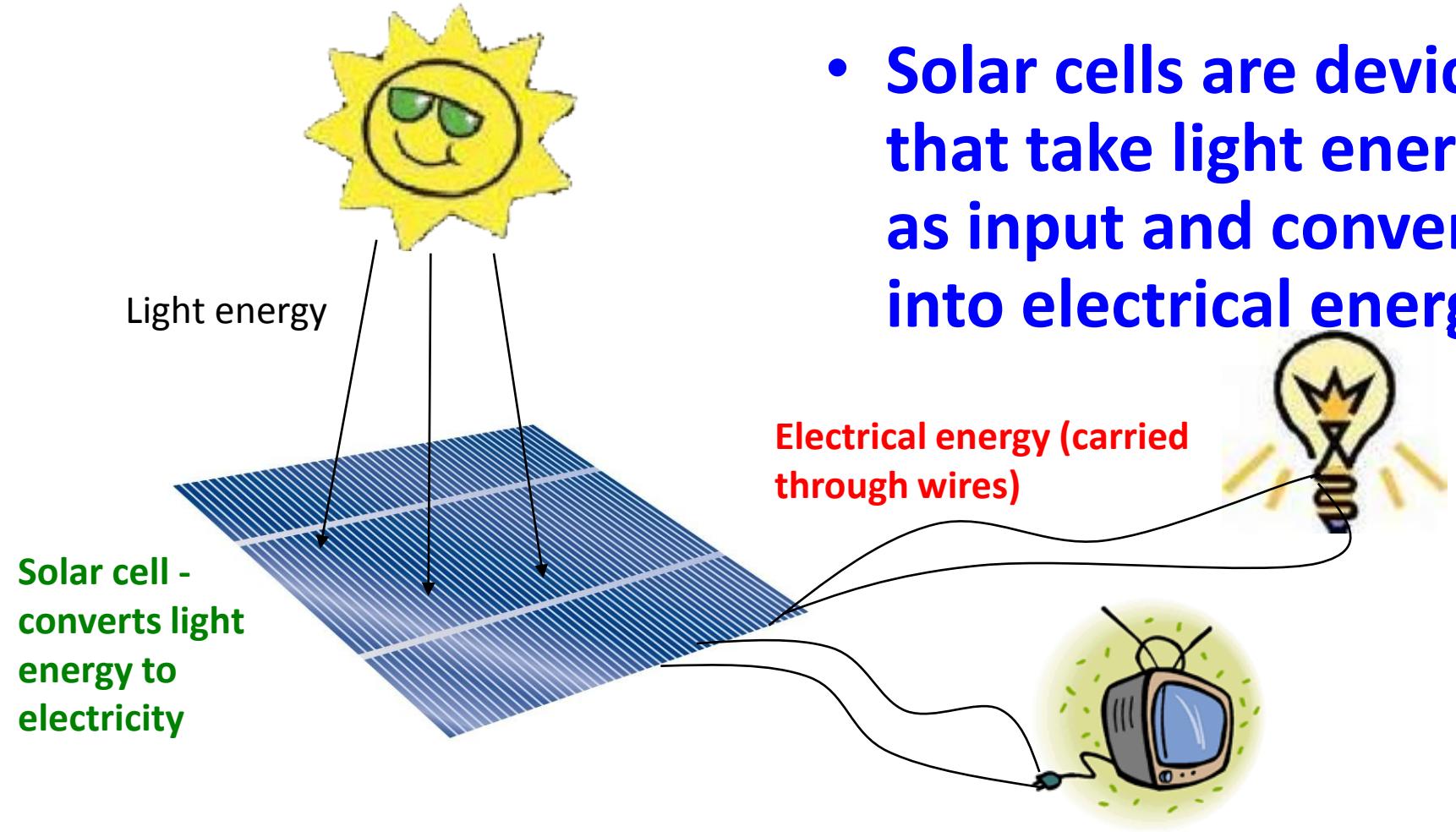


***The surface receives about 47% of the total solar energy that reaches the Earth. Only this amount is usable*.**

टिकाऊ विकास

टिकाऊ विकास या 'स्वपोषी विकास' (Sustainable Development), विकास की वह अवधारणा है जिसमें विकास की नीतियां बनाते समय इस बात का ध्यान रखा जाता है कि मानव की न केवल वर्तमान आवश्यकताओं की पूर्ति हो, वरन् अनन्त काल मानव की आवश्यकताओं की पूर्ति सुनिश्चित हो सके। इसमें प्राकृतिक पर्यावरण की सुरक्षा पर विशेष बल दिया जाता है

Solar Cells are Converters of Energy…



- **Solar cells are devices that take light energy as input and convert it into electrical energy**

Sources: http://www.econedlink.org/lessons/EM189/images/cartoon_tv.gif http://emmagoodegg.blogs.com/thebeehive/images/lightbulb.jpg, http://www.torpedowire.com/solar.htm, http://www.uoregon.edu/~stiedeke/a3/assignment03/a3/assignment_images/cartoon-sun.jpg

…But Not All Energy is Converted

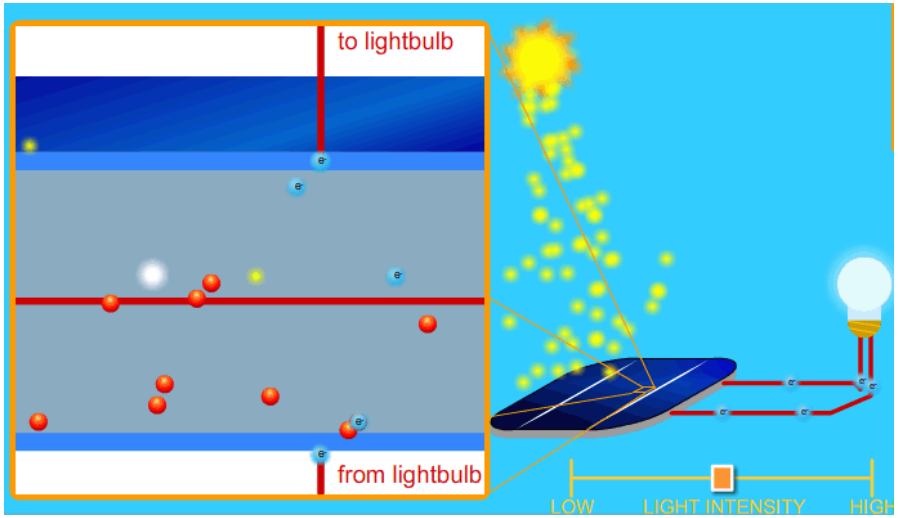
- **Like chloroplasts in plants, solar cells can only absorb specific wavelengths of light.**
- **In both, light that isn't absorbed is either transmitted through or reflected back.**
- **Whether a certain wavelength of lights gets absorbed depends on its energy.**

Chlorophyll molecules absorb blue and red light, but reflect green light

Source: http://ebiomedia.com/prod/cyclops/images/image004.jpg

How a Silicon-Based Solar Cell Works

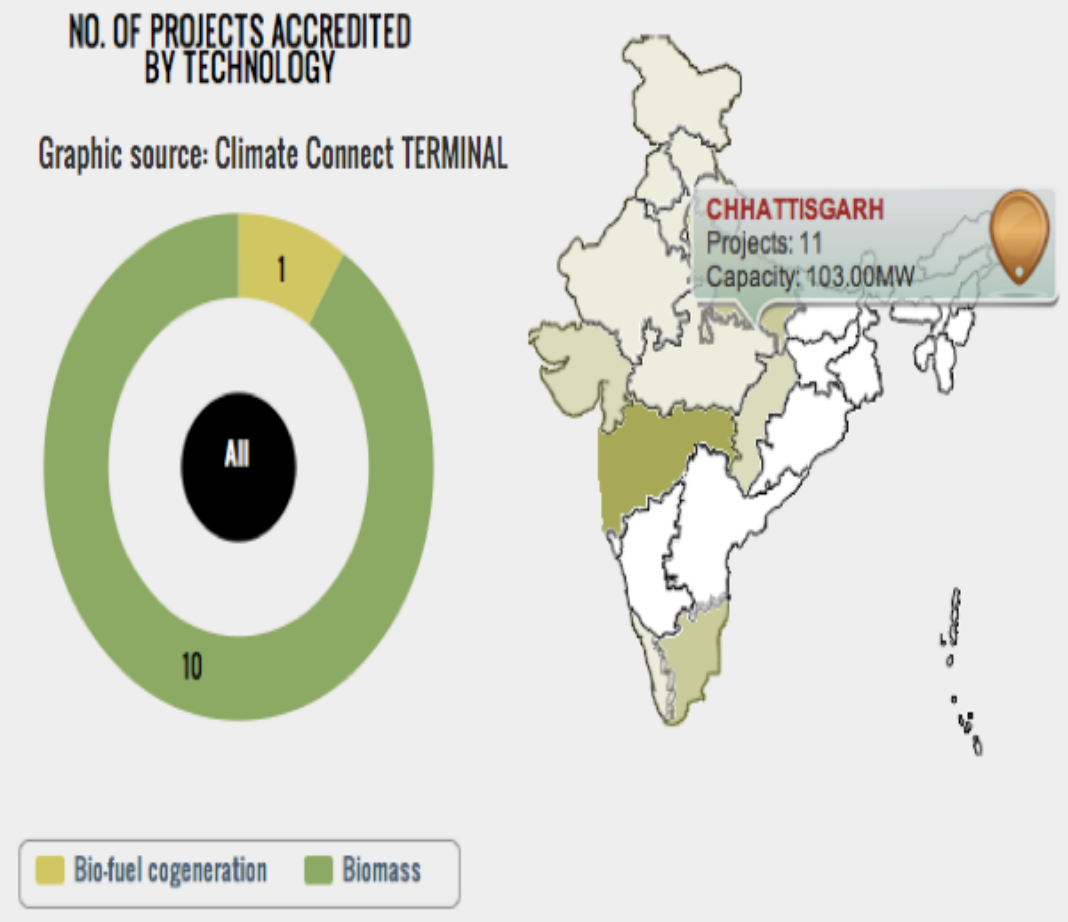
- **Light with energy greater than the band gap energy of Si is absorbed**
- **Energy is given to an electron in the crystal lattice**
- **The energy excites the electron; it is free to move**
- **A positive "hole" is left in the electron's place**
- **This separation of electrons and holes creates a voltage and a current**



Click image to launch animation (requires web access)

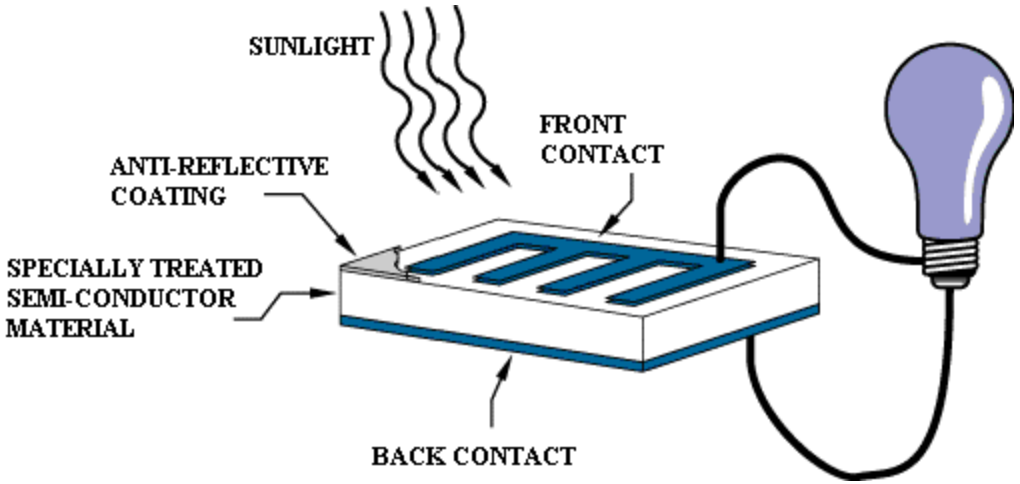
Source: http://nanosense.org/activities/cleanenergy/solarcellanimation.html

Chhattisgarh accounts for 17% of RECs issued with 100% redemption till Jan 12



The state was the first to accredit power projects based on bioenergy technology. As on 21 February 2012, the nodal agency Chhattisgarh State Renewable Energy Development Agency (CSREDA) has accredited 11 projects with combined generation capacity of 103 MW. ....

Brief Overview of Solar PV Technology

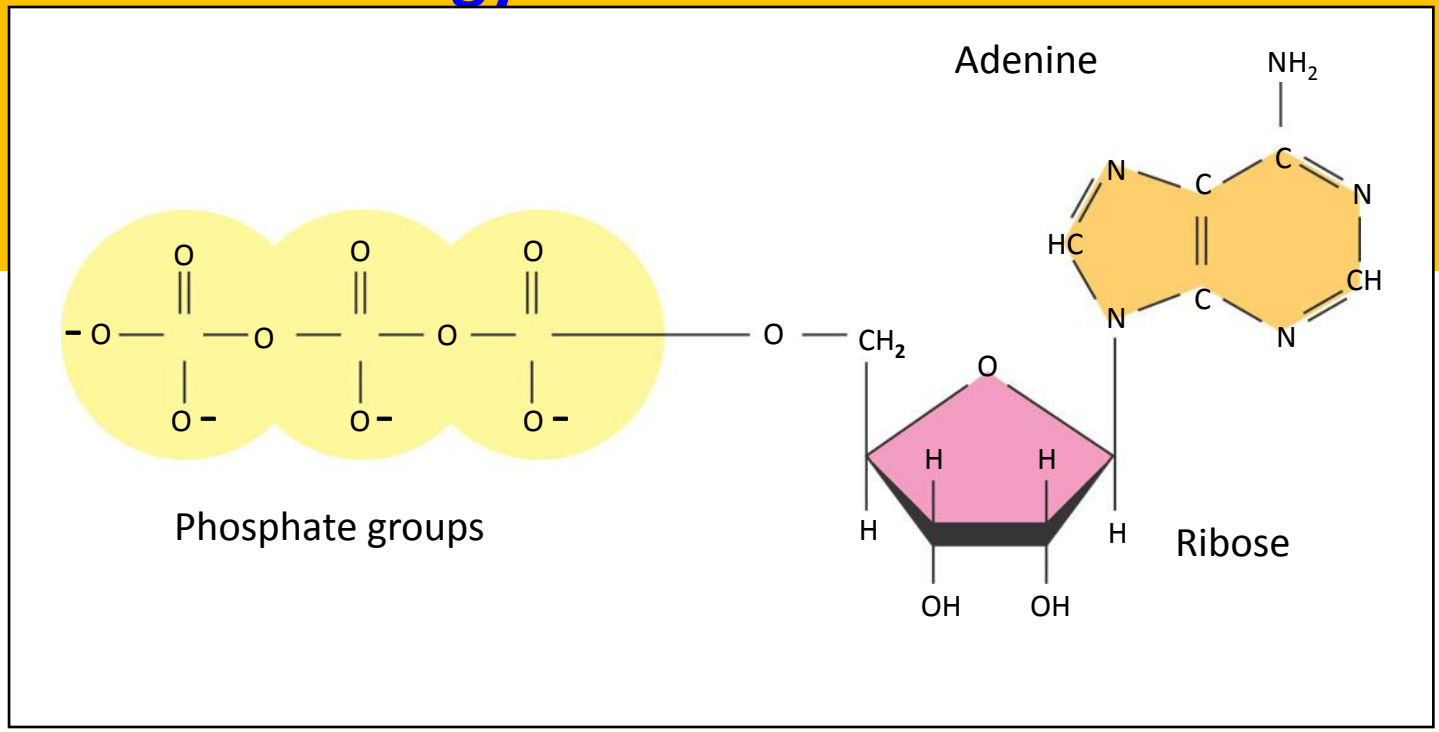


- **Solar cells are made of silicon (microelectronics/semiconductors)**
- **Treated to be positive on one side and negative on the other.**
- **When light energy hits the cell, electrons are knocked loose from the atoms in the semiconductor material.**
- **If electrical conductors are attached to the positive and negative sides, forming an electrical circuit, the electrons can be captured in the form of an electric current.**

The environmental imperative for renewable energy remains as clear and as simple as ever:
All energy use affects the environment.
For any given resource, technology choices and management practices alter environmental consequences.
Renewable energy technologies are, in the vast majority of cases, preferable to conventional technologies.
Most conventional energy technologies are ultimately unsustainable.

The Structure and Hydrolysis of ATP

- **ATP (adenosine triphosphate)**
  - **Is the cell's energy shuttle**
  - **Provides energy for cellular functions**



ALTERNATIVE SOURCES OF ENERGY :
Challenges and Opportunities

राष्ट्रीय विज्ञान दिवस)

1

Kallol K. Ghosh

School of Studies in Chemistry

Pt. Ravishankar Shukla University, RAIPUR

78% nitrogen

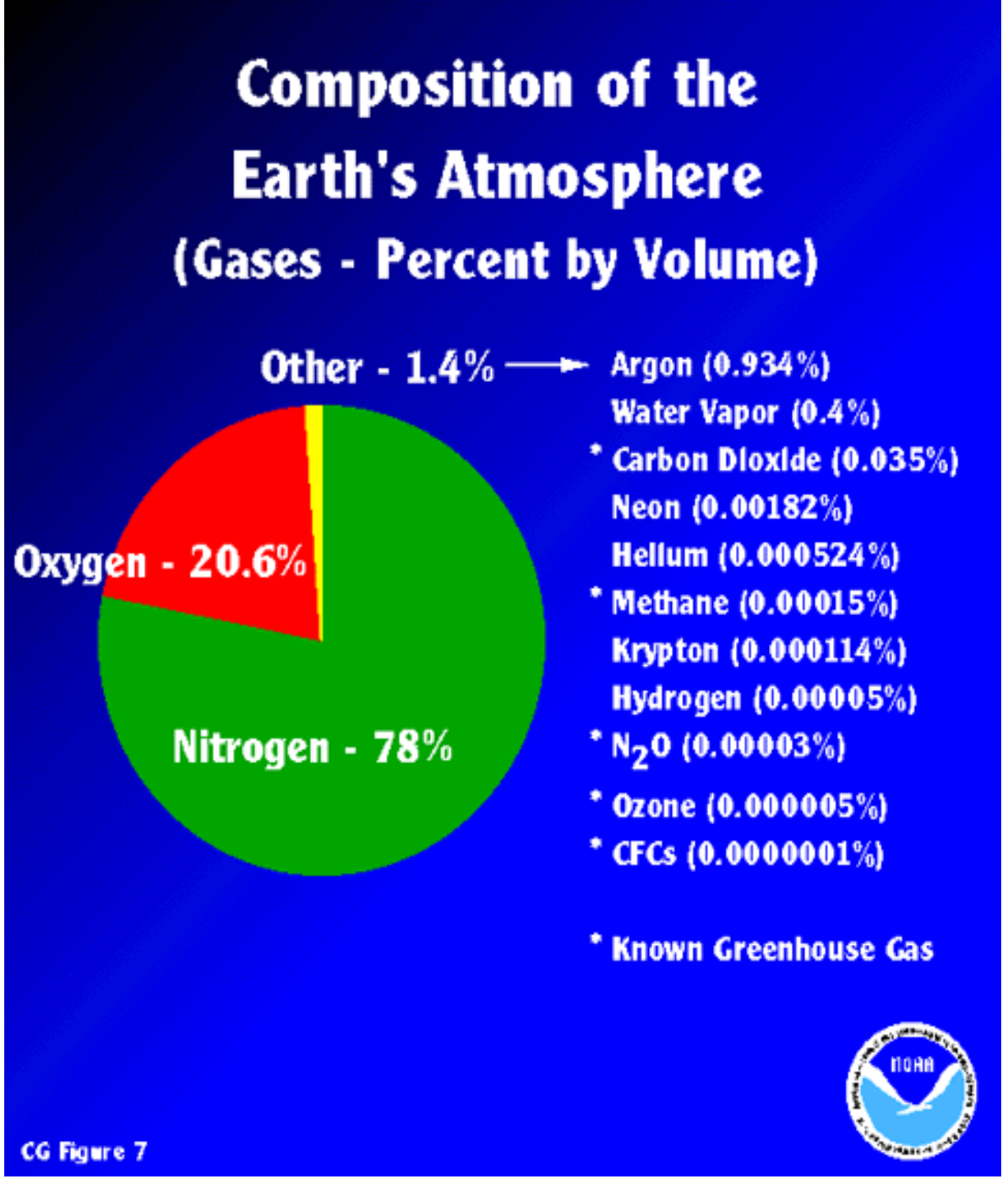
20.6% oxygen

< 1% argon

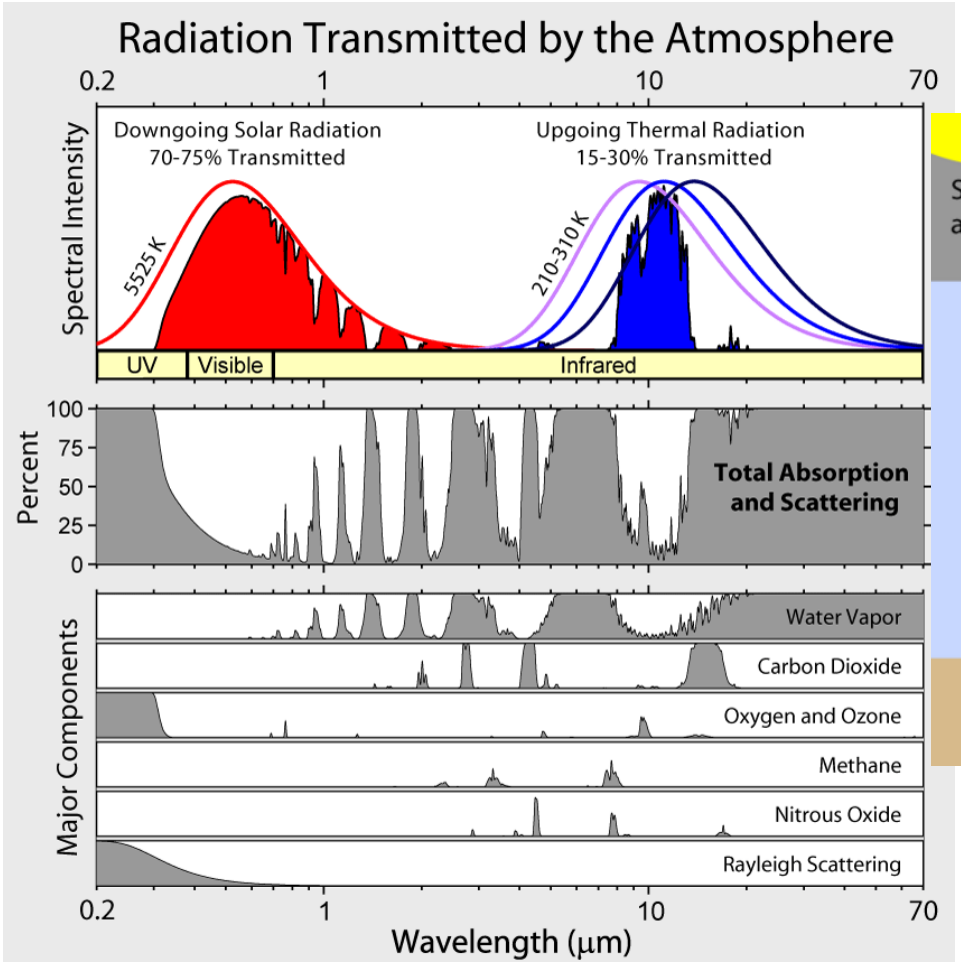
0.4% **water vapor**

0.036% **carbon dioxide**

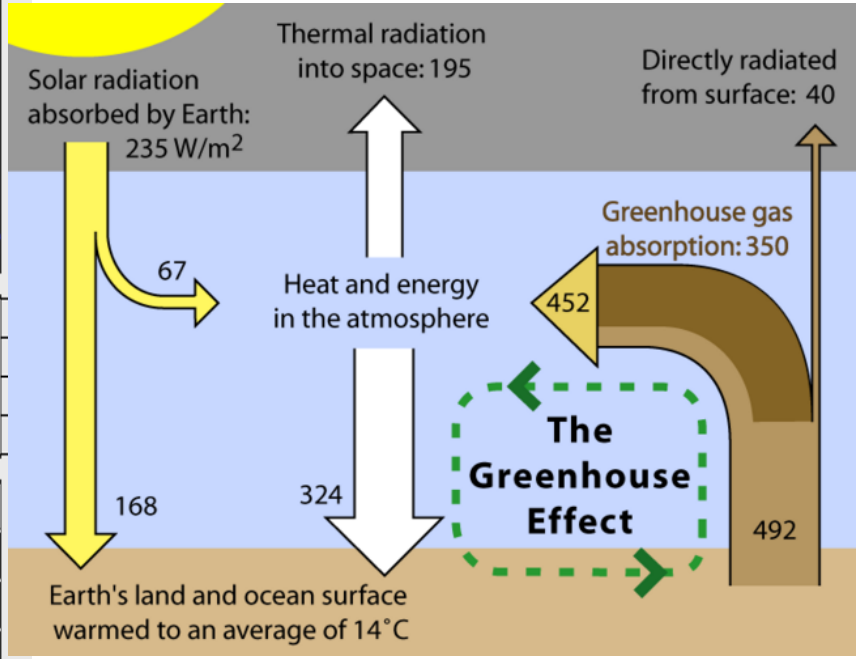
traces gases:
Ne, He, Kr, H, O_3
Methane, **Nitrous Oxide**



What is the Greenhouse Effect?



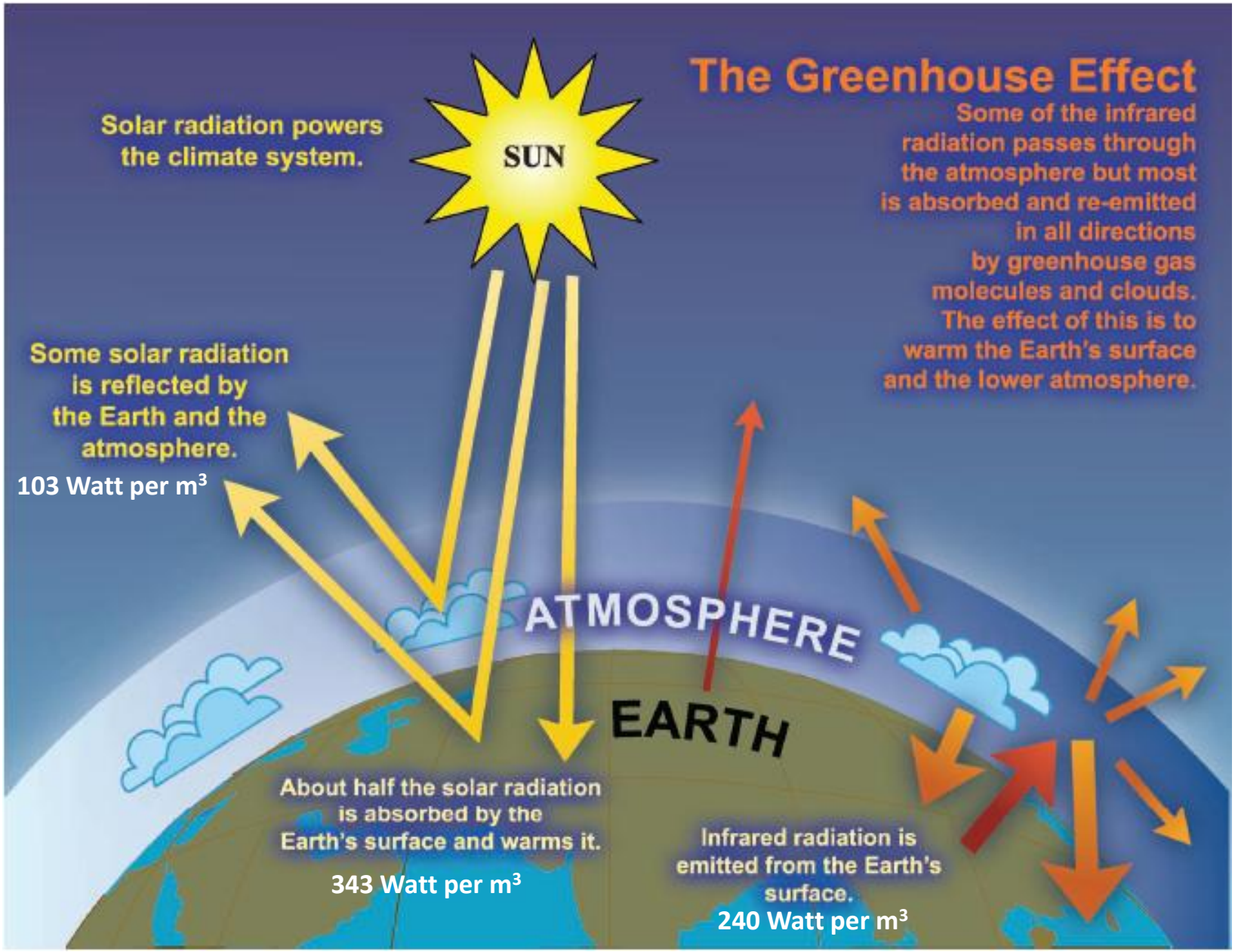
cc. Robert A. Rohde (Global Warming Art)



cc. Robert A. Rohde (Global Warming Art)

The temperature of the Earth depends on the amount of energy we receive from the sun versus the amount of energy lost back out to space.

Greenhouse effect



Source: Intergovernmental Panel on Climate Change

Greenhouse gases

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)

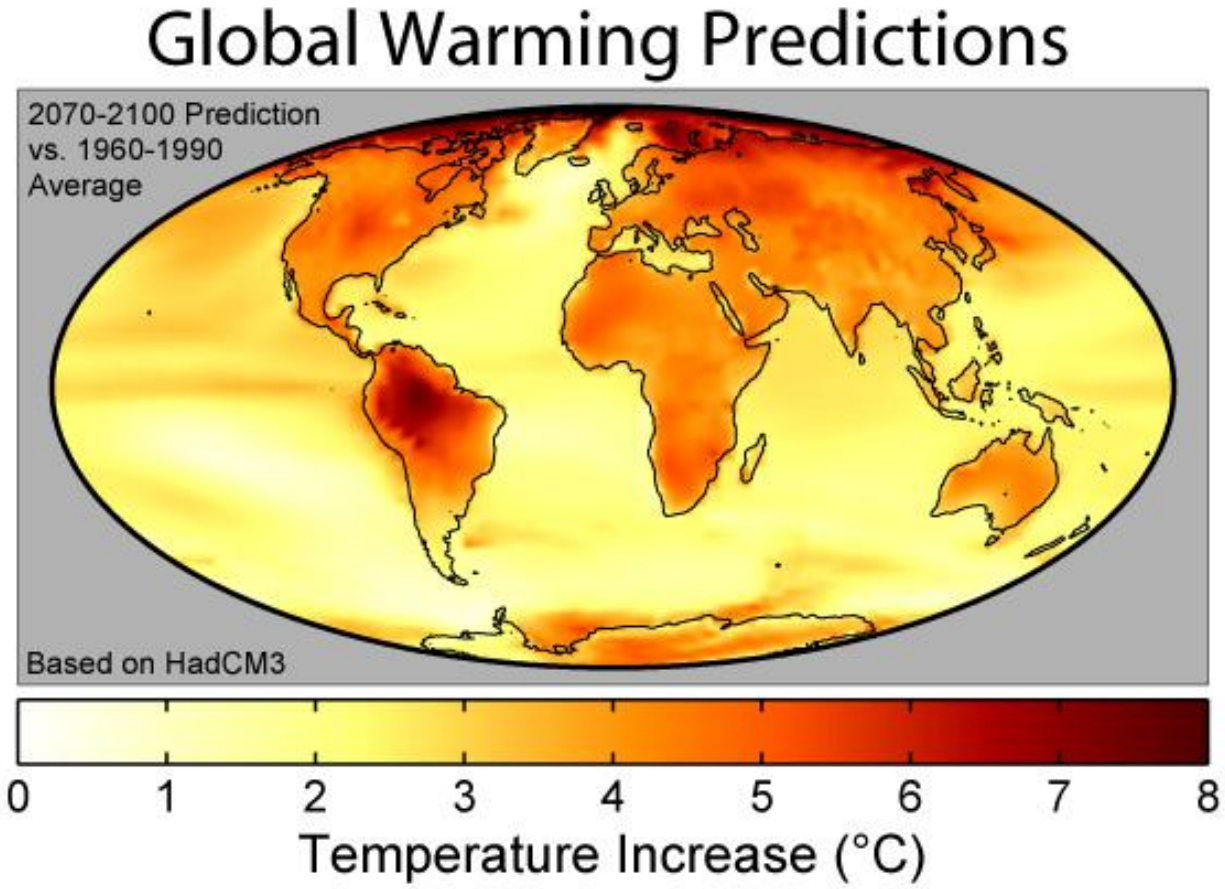
Natural

- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF6)

Manmade

Source: Kyoto Protocol- Annexure A

Future predictions...



- Based on no changes in emissions ("business as usual")
- The UK would be 2-3.5°C hotter on average.

~~Global Warming~~

~~Climate Change~~

Global Climate Disruption ☑

Which gas is keeping the Earth warm?

A. N_2?

B. O_2?

C. CO_2?

D. H_2O?

The major natural greenhouse gases are

- **water vapor, which causes about 36-70% of the greenhouse effect on Earth (not including clouds);**
- **carbon dioxide, which causes 9-26%;**
- **methane, which causes 4-9%, and**
- **ozone, which causes 3-7%.**

Note that it is not really possible to assert that a certain gas causes a certain percentage of the greenhouse effect, because the influences of the various gases are not additive. (The higher ends of the ranges quoted are for the gas alone; the lower ends, for the gas counting overlaps.)[3] [4]

From http://en.wikipedia.org/wiki/Greenhouse_gas

THANKS FOR YOUR ATTENTION

OUR RESEARCH GROUP

Dr. Shuchi Tiwari, Ms. Namrata Singh, Ms. Deepti, Dr. Santosh Verma, Mr. Birendra Kumar


Destruction
Each country that belongs to the OPCW must:
» destroy all chemical weapons it owns or possesses;
» destroy all chemical weapons it may have abandoned in another country;
» destroy facilities it owns or possesses which were involved in the production of chemical weapons.
ssistance and
The Chemical Weapons Convention
The Chemical Weapons Convention is an international treaty that bans the use of chemical weapons and aims to eliminate chemical weapons, everywhere in the world, forever.
The Convention provides the basis for the Organisation for the Prohibition of Chemical Weapons to monitor the destruction of existing, declared stocks of chemical weapons and the facilities used to produce them, as well as by checking industrial sites to ensure that chemicals monitored under the Convention are used in accordance with the chemical weapons ban. The OPCW also promotes international cooperation and the exchange of scientific and technical information so that people and governments can benefit from the peaceful uses of chemistry.
Each country that is a member of the OPCW commits itself never to:
» Use chemical weapons;
» Develop, produce, acquire, or keep chemical weapons, or transfer chemical weapons to anyone, anywhere in the world;
» Assist or encourage, in any way, anything that is prohibited by the Convention.

QUESTIONS