

**Government of India**  
**Ministry of Science & Technology**  
**Department of Science & Technology**

**BOYSCAST FELLOWSHIP FOR THE YEAR 2009-10**

The “Better Opportunities for Young Scientists in Chosen Areas of Science & Technology (BOYSCAST)” programme of the Department of Science & Technology (DST) provides opportunities to the young Indian scientists/technologists to visit institutions abroad, interact with scientists/technologists there, get trained in latest research techniques and conduct R&D in specially chosen frontline areas of science & technology. Applications are invited from Indian Nationals for the award of fellowships under the BOYSCAST programme for conducting advanced research and undergoing training in advanced research techniques in overseas research laboratories/institutes, in chosen frontline areas of science & technology for the period of **three to twelve months**. The areas are given below:

**Atmospheric and Earth Sciences:** Geotectonic models and experiments, Thermodynamics of multiphase systems, Isotope hydrology and glaciology, Isotope and chemical tracers for oceanography, Limnology, Global change, Palaeoclimatology and Palaeoenvironment, Evolution and dynamics of the Indian lithosphere, Seismic tomography, Recent advances in Seismology and tsunami probabilities, Wide angle MCS and MRP of marine sequences, Monsoon dynamics, Regional and global climate studies and predictions, Atmospheric effects on radio communications, Palaeobiogeochemistry and organic geochemistry, Satellite geophysics for atmospheric solid earth studies, Ground water source modeling, Atmospheric chemistry and air pollution, Long range transport of air pollution, Wet and dry deposition of pollutants.

**Chemical Sciences:** Organometallic, Heterogeneous catalysis, Novel materials, Bio-sensors, Bioinorganic and biomimetic chemistry, Molecular electronic structure and dynamics, Polymer and surface chemistry, Marine chemistry, Laser spectroscopy and chemical dynamics, Ultra-fast reactions, Photochemistry, Synthetic methodology, Magnetic resonance and magneto-chemistry, Supramolecular chemistry, Asymmetric synthesis, Molecular mechanics and energetics, Combinatorial chemistry, Chemical aspects of hydrogen storage and fuel cells, Chemical aspects of nano-materials and nano-technology.

**Engineering Sciences:** Computational fluid dynamics, Interface science and engineering, Development of speciality chemicals, Advanced materials, Surface technology, Laser materials processing, Smart sensors and materials, Transducer and sensor technology, Very large scale integrated (VLSI) system design, Embedded systems, Signal processing technologies, Micro-instrumentation/Nano-instrumentation, Micro-electro-mechanical systems (MEMS) and Nano-electro-mechanical systems (NEMS), Micro-fabrication/Micromachining and Nanotechnology, Multi-criteria decision making including genetic algorithms and neural networks, Optical information processing and optical computation, Quantum computing, Wireless communication/computing, Virtual reality, Internet techniques, E-commerce, Machine intelligence, Robotics and automation, Intelligent manufacturing, Recycling in manufacturing, Computer integrated manufacturing, Manufacturing process simulation, Advanced production technologies, Advanced mechanical design, Mechatronics, Fuel cells, Thermal engineering, Magnetics (magnetostriction, giant-, colossal- and tunneling- magneto-resistance, magneto-fluidics, magneto-refrigeration), Advanced characterization techniques, Bio-mechanics, Smart structures/earthquake engineering, Textile technology.

**Life Sciences:** Gene therapy, Site directed mutagenesis, Magnetic encephalograph, Brain mapping, Functional NMR/In vivo spectroscopy, Biomedical engineering, Transplant biology, Ecological engineering, Reproduction technology, Biodiversity and conservation biology, Industrial microbiology, Plant-microbe interaction, Crop biotechnology including molecular mapping, Molecular marker assisted plant breeding, Transgenic plants and animals, Plant genetic resources, Molecular biology of biotic and abiotic stresses in plants, Evolutionary biology, Genetic engineering, Modeling for new drug development, Molecular epidemiology, Drug delivery systems, Biological sensors, Molecular cytogenetics, Vaccine development, Stem cell research, Organ transplantation, HIV/AIDS research.

**Mathematical Sciences:** Algebra, Analysis, Topology, Differential and algebraic geometry, Lie theory and representation theory, Number theory, Differential equations, Non-commutative geometry, C\*- Algebras,

Computational aspects of geometry and algebra, Design of efficient numerical/qualitative methods for solving differential equations (both ODE and PDE), Stochastic process modeling, Algebraic and geometrical methods in control theory, Mathematical theories of systems and Cybernetics, Exploratory data analysis, Dynamical systems, Game theory, Combinatorial optimization, Spectral and inverse spectral theory, Wavelet analysis, Graph theory, Fuzzy/Hazy/Rough set theory, Mathematical logic, Expert systems and artificial intelligence, Computability and Complexity theories, Parallel computing and artificial neural net theory.

**Physical Sciences:** Electronic materials and processing, Nonlinear optics and optical materials, Nano-phase materials, Optoelectronics, Gradient-index and Micro-optics, Semiconductor physics, Ultra-fast phenomena, Plasma physics and plasma diagnostic techniques, Development of Synchrotron radiation sources, Physics of advanced instrumentation.

**Promising applications in areas other than the above areas may also be considered.**

**ELIGIBILITY CRITERIA:** Young Indian scientists/technologists who fulfill the following conditions can submit application/proposal for award of BOYSCAST fellowship:

**(i) Academic Qualifications:** Master's Degree in Engineering/Technology or equivalent or M.D. in Medicine or equivalent with research experience or Ph.D. in Science/ Engineering or equivalent. **(ii) Age:** Upto 35 years (as on 1<sup>st</sup> April, 2009). The applicants belonging to SC/ST/OBC and women candidates may be allowed relaxation in the age limit upto 5 years. **(iii) Employment:** A regular position in a recognized S&T institution/university/college. Applications from persons holding temporary positions such as research fellows or research associates etc. will not be considered. Candidate must be officially sponsored (their application to be formally forwarded) by the employer/head of the institution or agency with commitment to depute them for research/training under BOYSCAST programme. Forwarding note merely stating that above would be considered only after award of fellowship will not be considered by DST. **(iv) Areas of work:** Area proposed by the candidate should be in line with the above mentioned chosen areas. **(v) Place of work:** The fellow should be accepted by a foreign academic/scientific/technological institution, which is internationally recognized as an outstanding institution where major work in the identified area is in progress. There should be willingness of the foreign institution to accept and extend necessary support to the candidate for the work proposed. The Professor/scientist with whom the fellow intends to work should be a research worker of repute. The candidate should himself/herself correspond with their proposed host institution/Professor abroad for placement. Candidate is required to produce evidence, in the form of a letter of acceptance from the overseas institution to be visited along with merits/uniqueness of that host institute in the proposed area. If the applicant has already worked at an institute abroad for a considerable period of time, the proposal to visit the same institute/work there is not likely to be considered favorably. **(vi)** Young scientists and technologists actively engaged in research and having established credibility in the proposed area of work will be preferred. **(vii)** The institute to which the candidate belongs, should have either already initiated major research activities in the chosen area or should have immediate plans to initiate such programmes, based on the expertise of the individual and proposed training abroad. **(viii) Candidates who have earlier availed of the BOYSCAST fellowship will not be eligible for consideration again for this fellowship. The candidates who have availed any other overseas fellowship for a period of more than three months through any Government/public funding agency during last two years will also not be considered for this fellowship.** Preference is likely to be given to the applicants who don't have any/have limited international exposure as compared to the applicants who have adequate international exposure during recent past, if they are otherwise suitable.

**GUIDELINES GOVERNING THE PROGRAMME:** (i). The individual availing this fellowship would be called a BOYSCAST FELLOW. (ii). The fellow will be entitled to the following: (a) Fellowship amount of **US \$ 3000 (or equivalent in other foreign currency) per month for the period of stay (maximum duration being twelve months) at the host institute abroad.** The institution to which the candidate belongs would be responsible for necessary foreign exchange arrangements. (b). Cost of air passage in economy class by Air India from the place of working in India to the place of the overseas host institute and back by shortest route. The fellow may, however, travel by airlines other than Air India, if the fare offered by the other airlines is competitive/cheaper as compared to Air India. (c) One time contingency grant of Rs.15,000/- if the fellowship duration is upto six months and Rs.20,000/- if the fellowship duration is more than six months. (d). Fellow will also be permitted to travel within host country to attend conferences or visit other institutes of interest with the approval of the Guide at the host institute and as per

DST rules. The Fellow will be entitled to a grant of US \$ 600 (or equivalent in other foreign currency) for fellowship duration upto six months and US \$ 1200 (or equivalent in other foreign currency) for fellowship duration beyond six months for this purpose. (iii). Rules governing payment of salary, leave, medical, gratuity, GPF and pension etc. of the Organisation/Institution/University to which the fellow belongs would continue to be applicable. No liability on any of these accounts will be borne by DST. (iv). The candidate selected for the award of the BOYSCAST fellowship should preferably commence their research/training before the end of the financial year in which the award is given. Failure to do so would render the fellow forfeit the award. The decision of DST on all these matters would be final. (v). Visa arrangements are to be made by the candidate. (vi). The BOYSCAST fellow will not accept fellowship/financial assistance from any other source at the host institute abroad during the period of fellowship.

**PROCEDURE FOR APPLICATION:** Application for the award of BOYSCAST fellowship should be sent in the formats given below. The matter should be neatly typed as per the formats (and not as annexures) and should not exceed 15 to 20 typed pages. Seven copies of the application (one in original and six copies) are required to be submitted. The application is required to be forwarded through the head of the institute where the applicant is employed. The application should contain (a) A recent letter of acceptance from foreign institution to be visited by the candidate specifically mentioning the BOYSCAST fellowship, **in original** with the original copy of the application. The other six copies of the application should contain photocopy of this letter. (b) Endorsement **in original** from head of the parent institution/organization on letter head as per the prescribed format No. (2) with the original copy of the application. The other six copies of the application should contain photocopy of this endorsement. (c) In case of SC/ST/OBC candidates, an attested copy of the certificate indicating the category to which the candidate belongs. A self addressed stamped postcard may accompany the application for acknowledgement.

**Application complete in all respects should reach DST positively by 31st July, 2009.** Application should be sent to: **Dr. P.K. Malhotra, Scientist 'G', SERC Division (BOYSCAST Programme), Department of Science & Technology, Technology Bhavan, New Mehrauli Road, New Delhi-110016.** Incomplete application and application not duly forwarded by the parent institution/organization or received after the last date will not be considered. Advance copy of application will not be accepted.

## FORMATS

### (1) APPLICATION (SEVEN COPIES - One in original and six copies)

- 1.1 Name:
- 1.2 Designation and Department/Division:
- 1.3 Parent institute's name and address (with telephone/fax/email):
2. Date of birth & age (as on 1.4.2009):
3. Sex (Male/Female):
4. Category (General/SC/ST/OBC):  
(Please attach a copy of the certificate attested by a Gazetted officer in case you belong to SC/ST/OBC category with the application)
5. Full details of Academic qualifications (Bachelor's degree onwards with awarding university/institute, year, specialization and academic distinction, if any):
- 6.1 Details and nature of present and previous employment (Positions held, employer/place of work, duration, area/nature of work):
- 6.2 Do you hold a regular/permanent position in your institute? (Yes/No):
- 6.3 Endorsement/Statement from the parent institute/organization (as per format No. 2) enclosed (Yes/No):  
Please enclose the original endorsement certificate with the first copy and photocopies with the other six copies of the application.
7. \*Brief summary of your current research work (about 500 words):
8. \*(a) List of research publications in refereed journals [excluding papers presented in conferences, symposia etc.] during last five years (from the year 2004 onwards). Please mention journal impact factor for each publication. {Enclose one copy of reprints of your three best publications with all the seven copies of the application}:  
(b) Papers presented in conferences (list only):  
(c) Number of Ph.D. students guided:  
(d) Details of training courses conducted:  
(e) Honours and awards received:
9. \*Details of proposed research programme/training:  
(i) Proposed duration of the fellowship (from 3 to 12 months). Please specify based on your correspondence with host institute. (It will not be possible to change the duration later):  
(ii) Broad area of research (e.g. Life sciences, Chemical sciences, etc.):  
(iii) Chosen area in which research programme/training is proposed (as per DST's list):  
(iv) Are major research activities already going on in the chosen area at your institute?:  
(v) Proposed research programme/training:  
(a) Objectives and technical details of the proposed work (about 2-3 pages):  
(b) Work plan:  
(c) Expected outcome of the proposed work:  
(vi) Can the proposed work be undertaken in any Indian institute? If yes, please specify. If no, why not? :  
(vii) Justification of its importance and relevance to ongoing/future programmes of the institution of the applicant:  
(viii) Future scope of application in India:  
(ix) Future plans of utilizing the expertise in India which would be gained from training/research pursued at the overseas host institute (about 500 words):
10. Proposed place of research/training:  
(a) Overseas host guide and institute with complete address:  
(b) Justify its selection and enclose consent of overseas host guide/institute for accepting the applicant as BOYSCAST fellow; the proposed work, along with facilities to be provided (one copy in original to be attached with the first copy of the application and photocopies to be attached with the other six copies of the application):  
(c) Do you propose to visit any other institute/attend any conference in the host country during your stay? If yes, please give details:
11. Overseas visits:

Sl.	Address of overseas	Duration	Agency which sponsored	Purpose of	Achievement/
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No.	institute visited	From	To	the visit	visit/Brief objective of the work done	Outcome

12. Do you have an ongoing S&T project?:

Sl. No.	Title	Date of start & Date of completion	Cost (Rs. in lakhs)	Agency & Ref. No.

13. Details of institutes/scientists and engineers engaged in proposed area of study within India (if any):

14. Name and address of upto five Indian referees in the selected area:

15. Have you applied for BOYSCAST fellowship previously? (if yes, please give details):

Place:

Date:

(Signature of Applicant)

\*Please provide information in the main body of the application and **NOT** as Annexures.

## (2) STATEMENT FROM THE PRESENT EMPLOYER

(This should be given on the **official letter-head** of the institution/organization in the following format. The format should be followed as such. If it is altered, the application is not likely to be considered. **Original certificate** may be enclosed with the first copy of the application and photocopies may be enclosed with the other six copies of the application):

This is to certify that this institution has no objection to the consideration of application for BOYSCAST Fellowship (2009-2010) under Department of Science & Technology, New Delhi, from Mr./Ms./Dr.....permanent employee in the .....(*name of the department/institute/organization*)..... for conducting research/undergoing training in advanced research techniques in the area of.....to be held at.....for the duration of.....( ) months.

If the fellowship is awarded to him/her, Mr./Ms./Dr.....will be relieved from .....(*name of the institute/organization*)..... duties to join the host institute abroad on the BOYSCAST fellowship. During the period of fellowship, the continuity of employment on the post presently held by him/her would continue to be applicable and rules governing payment of salary (basic pay and all allowances), leave, medical benefits, gratuity, GPF, GIS, and pension etc. would continue to be applicable during the entire period of fellowship and he/she will join his/her present post on completion of tenure of his/her fellowship.

If Mr./Ms./Dr.....is selected for BOYSCAST fellowship, .....(*name of the institute/organisation*)..... will take a bond from him/her to serve institute/any where in India for a period of at least three years after pursuing research in the area of specialization abroad.

Place:

Date:

(Head of Institution/Organisation)

Official seal