



The Royal Academy
of Engineering

THE ROYAL ACADEMY OF ENGINEERING APPLICATION FORM FOR RESEARCH EXCHANGES WITH CHINA AND INDIA – SHORT AWARD

You should read the Notes for Guidance before completing this application form. The completed form and supporting documents must reach the Academy by 12.00pm on Friday 17 October 2008. A single email with the completed form and supporting documents can be sent. Alternatively, the original plus 1 copy of the application form and supporting documents can be sent by post. Any applications that are incomplete or do not adhere to the guidelines will be rejected. All enquires, applications and correspondence should be sent to:

Dr Shafiq Ahmed, Assistant Manager – International,
The Royal Academy of Engineering, 3 Carlton House Terrace, London SW1Y 5DG

Email: shafiq.ahmed@raeng.org.uk
Tel: +44 (0)20 7766 0642 Fax: +44 (0)20 7930 2054
www.raeng.org.uk/international

SECTION A – TYPE OF AWARD

Direction of Exchange:	<input checked="" type="checkbox"/> Outgoing (from the UK) to China	<input type="checkbox"/> Outgoing (from the UK) to India
UK)	<input checked="" type="checkbox"/> Incoming from China (to the UK)	<input type="checkbox"/> Incoming from India (to the UK)
Type of application:	<input type="checkbox"/> Single	<input checked="" type="checkbox"/> Joint
Duration of Exchange: 2 weeks	Start date: 10 May 2009	End date: 7 June 2009

SECTION B – PERSONAL DETAILS

i) Details of the Visiting Researcher

Title and Forename	Professor Sergei
Surname	Sazhin
Current Position	Professor of Thermal Physics
University or Institution	University of Brighton
Division or Department	School of the Environment and Technology
Address	Cockcroft Building, Lewes Road Brighton BN2 4GJ, East Sussex, UK
Telephone No	01273 642677
Fax	01273 642309
Email	S.Sazhin@brighton.ac.uk

ii) Details of the Host Researcher

Title and Forename	Dr. Bingyang
Surname	Cao
Current Position	Senior Lecturer
University or Institution	Tsinghua University
Division or Department	School of Aerospace
Address	Yifu Building, School of Aerospace, Tsinghua University, Beijing 100084, China
Telephone No	+86-10-6278-1610
Fax	+86-10-6278-1610
Email	caoby@mail.tsinghua.edu.cn
Nationality	Chinese

SECTION C – ACADEMIC AND PROFESSIONAL RECORD

i) Academic and Professional Record of the Visiting Researcher

Please attach a copy of a Curriculum Vitae (CV) of the Visiting Researcher. This should be no longer than 4 pages. See Notes for Guidance for further details.

ii) Academic and Professional Record of the Host Researcher

Please attach a copy of a Curriculum Vitae (CV) of the Host Researcher. This should be no longer than 4 pages. See Notes for Guidance for further details.

SECTION D – VISIT DETAILS

i) Keywords: Identify up to 10 keywords which accurately describe the research field. These keywords will be used to help identify suitable referees.

Energy, engines, heat transfer, evaporation, droplets, Diesel fuel, kinetic modelling

ii) Work programme: Please give a work breakdown of up to 500 words in length (see Notes for Guidance). This should include proposed dissemination activities and plans for follow up. Please include a statement on the added value to be gained from the exchange.

The main objective of the proposed exchange is to establish a framework for the development of possible collaborative research between Tsinghua University (Beijing, China) and University of Brighton (UK). Dr Cao and Professor Sazhin became acquainted during the 13th International Heat Transfer Conference in August 2006. They have maintained contact and extensively discussed research problems of common interest. The research conducted by Prof. Sazhin has mainly focused on theoretical and experimental studies of fluid dynamics, heat /mass transfer and combustion processes in internal combustion engines. These include the development of new physical and mathematical models for fuel spray autoignition and fuel droplet heating and evaporation in the presence of heat flux and background gas using the combined kinetic and hydrodynamics approach. For this approach, it is essential to know the evaporation coefficient of fuel droplets. The most accurate method to determine this coefficient is based on the molecular dynamics simulation technique. Dr Cao and his₂

colleagues, including Professor Zeng-Yuan Guo, have extensive experience in the development and application of this technique. They would welcome the opportunity to investigate its applicability to the determination of the evaporation coefficient in Diesel engine conditions as part of their contribution to the collaborative work. Another area of possible collaboration could focus on the concepts of field synergy and entransy, introduced into heat transfer theory by Dr Cao's colleagues. These concepts could be used for the analysis of heat and mass transfer processes in fuel droplets, and even optimisation of the processes in engines. We also expected that through sharing experiences, colleagues from the University of Brighton will help Dr Cao and colleagues to focus their work on important practical problems related to specific conditions in internal combustion engines. Hence, this collaboration is expected to be beneficial to both groups.

During Professor Sazhin's visit to Tsinghua University, these areas of collaboration will be discussed in depth, both from the perspectives of science/ engineering and possible large scale joint projects. Professor Sazhin will also give a presentation on the current research interests of himself and colleagues at the University of Brighton. He will be introduced to Dr Cao's colleagues and shown the facilities at Tsinghua University. Similar activities are anticipated for Dr Cao's visit to the University of Brighton. Professor Sazhin plans to visit Tsinghua University on 10th May 2009 and stay for 7 days. The return visit by Dr Cao to the University of Brighton is expected to last from 31 May 2009 until 7th June.

It is anticipated that this exchange will lead to closer collaboration between the groups, a joint publication in a leading international refereed journal (International Journal Heat and Mass Transfer). Both groups have extensive experience of publishing papers in this and similar journals. It is also likely that some results will be reported in joint conference presentations. Additionally, we plan to apply for support for a possible joint project, which would enable both groups to investigate the abovementioned problems further, keeping in mind the practical engineering application of the results.

SECTION E – FUNDING

i) Summary of Resources Required for Exchange

Please provide details of the breakdown of costs for the exchange for the full duration of the visit. For Short Awards funding is provided up to a cap of £3,000. For Joint Exchanges please indicate the costs for each exchange.

Item	Cost (£)	Cost (£) (for Joint Awards only)
Travel	850	850
Accommodation	410	470
Subsistence	100	140
Visa	90	90
Other Costs		
Total	1450	1550

ii) Related Proposals

Please state if this proposal is related to a proposal you have previously submitted to the Academy for another award.

Scheme	Date of application (month and year)	How is the proposal related?
Research Exchange with China	October, 2007	This is essentially the same proposal as submitted earlier. Funds not allocated – no rating provided

SECTION F – DECLARATION

(To be signed by the Host and Visiting Researcher)

1. I accept the terms and conditions set out by The Royal Academy of Engineering.
2. I certify that, to the best of my knowledge and belief, the details in this application are complete and accurate and I undertake to inform The Royal Academy of Engineering immediately of any change in the information given.
3. I am satisfied that language will not be a barrier in regard to a successful collaboration and, if necessary, general language support and training will be obtained.
4. I commit to provide the required remaining funds for the exchange.
5. An agreement regarding issues related to identification, protection and subsequent exploitation of IP generated from the research will be in place before the start of the Exchange.
6. I agree for the information provided to be disclosed to external third parties for peer review and other relevant parties solely for the purpose of operating this scheme.
7. The Host Institution agrees to host the Visiting Researcher in the department during the visit and to make available adequate facilities.
8. The UK Institution will bear responsibility for the correct use of the funds awarded by the Academy.


i) Signed (Host Researcher):



Date: 15 Jul, 2008

Name: Bing-Yang Cao

ii) Signed (Visiting Researcher):



Date: 15 July 2008

Name: Sergei Sazhin

SECTION G – STATEMENT OF SUPPORT

TO BE COMPLETED BY THE HEAD OF DEPARTMENT AT THE HOME INSTITUTION OF THE VISITING RESEARCHER.

STATEMENT ON THE PROPOSED AIMS OF THE VISIT AND GENERAL SUITABILITY OF THE VISITING RESEARCHER FOR THE RESEARCH EXCHANGE (NO MORE THAN 250 WORDS).

Professor Sergei Sazhin is one of the leading researchers in School of Environment and Technology at the University of Brighton. His current research interests are focused on theoretical and numerical modelling of fluid dynamics, heat/mass transfer and combustion processes in internal combustion engines. He is an author of over 300 publications in physics and engineering, including 2 monographs and 166 papers in international refereed journals. He has supervised 10 PhD students to successful completion over the last seven years. He is actively involved in the teaching process at our university. He is responsible for Thermofluids, Fluid Dynamics and Computational Fluid Dynamics modules and supervision of final year projects.

I am aware of Professor Sazhin application for support of exchange with his colleague Dr Cao. I believe that the visit by Prof. Sazhin to Tsinghua University and the return visit by Dr Cao to the University of Brighton will be beneficial to both our universities. I support both these visits without reservation.

I agree for the Visiting Researcher, Professor Sazhin, to spend the length of the award at an international institution. This will not conflict with other responsibilities (e.g. teaching) and suitable arrangements will be made to cover the commitments.

Signed: 

Date: 14th July 2008

Name: Professor Callum Firth

Position: Head of School of Environment and Technology

Organisation: University of Brighton

Address: Cockcroft Building, Lewes Road

Brighton BN2 4GJ

Tel No: 01273 64 2289

Fax No: 0 1273-642285

Email: C.Firth@brighton.ac.uk


SECTION H – STATEMENT OF SUPPORT (TO BE COMPLETED ONLY FOR JOINT APPLICATIONS)

TO BE COMPLETED BY THE HEAD OF DEPARTMENT AT THE HOME INSTITUTION OF THE SECOND VISITING RESEARCHER.

STATEMENT ON THE PROPOSED AIMS OF THE VISIT AND GENERAL SUITABILITY OF THE VISITING RESEARCHER FOR THE RESEARCH EXCHANGE (NO MORE THAN 250 WORDS).

Dr. Bingyang Cao is one of the brightest researchers in the Department of Engineering Mechanics, Tsinghua University, China. His current research interests include development of new approaches to analysis and optimization of heat and mass transport processes, micro- and nano-scale heat and fluid flow and molecular dynamics simulation. He has performed excellent work in the above fields and published over 40 papers, including 20 papers in international refereed journals. He and his colleagues calculated the evaporation and condensation coefficients of liquid argon and water using molecular dynamics simulation technique. It is anticipated that a similar technique can be applied for calculating this coefficient for Diesel fuel, approximated by n-dodecane, taking into account the complicated structures of these molecules. Dr Cao's group have introduced new concepts of field synergy and entransy. The application of these concepts is expected to be helpful in the modelling of heat/ mass transfer processes in fuel droplets. There is a clear overlap between the research interests of Dr. Cao and Professor Sazhin. The return visit by Prof. Sazhin to Tsinghua University and the return Dr Cao's visit to the University of Brighton are expected to be beneficial to both our institutions. I support both these visits without reservation.

I agree to the Visiting Researcher, Dr Cao, spending the length of the award at an international institution. This will not conflict with other responsibilities (e.g. teaching) and suitable arrangements will be made to cover the commitments.

Signed: 

Date: 2008.7.15

Name: Luming Li

Position: Professor, Deputy Dean

Organisation: Tsinghua University

Address: School of Aerospace,
Tsinghua University, Beijing 100084, China

同意申请
任伟

08-7-16

Tel No: 86-10-6278-5716

Fax No: 86-10-6278-5716

Email: lilm@mail.tsinghua.edu.cn

CHECKLIST:

- ✓ The original application form and 1 photocopy if sent by post, including:
- ✓ copies of the CV of the Visiting Researcher and Host Researcher.

- ✓ The application form should be:
- ✓ signed by the Host Researcher and Visiting Researcher (scanned or faxed pages **are** acceptable).
- ✓ supported and signed by the Head of Department (or Head of Faculty) at the Home Institution (Scanned or faxed pages **are** acceptable).

CONTACT:

Please send completed applications together with supporting documents to:

Dr Shafiq Ahmed
Assistant Manager – International
The Royal Academy of Engineering
3 Carlton House Terrace
London SW1Y 5DG

Email: shafiq.ahmed@raeng.org.uk

Tel: +44 (0)20 7766 0642

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Applications should be received no later than 12.00pm on Friday 17 October 2008. Applications received after this date will not be considered.