NEWS India-UK Fellowship

Applications are invited for the NEWS India-UK Research Fellowship held at one of the UK partner institutes: Centre or Ecology and Hydrology, the University of Edinburgh (School of GeoSciences) or the University of Aberdeen (The Institute of Biological and Environmental Sciences). The fellowship is for between 3 weeks to 6 months and should be completed within 12 months after 1st of October of the year of the application period. The fellowship is intended to provide an opportunity for junior as well as senior researchers to come to the UK to develop and share skills in N-focused genetic or flux measurement techniques and specific modelling methods (see the offered research areas below) as well as to develop scientific cooperation.

Applicants must be Indian citizens, and resident and pursing their scientific research in India. Applicants for the Senior Fellowships must have a doctorate and at least 5 year post-doctoral experience. Applicants for the Junior Fellowship must be a PhD student or a researcher with less than 5 year post-doctoral experience.

The successful applicant will be expected to be in residence in the city of the hosting institute (Edinburgh or Aberdeen) for the duration of the Fellowship. The Fellowship provides a monthly allowance for living expenses in the UK of £1500 for the junior fellows and £2000 for the senior fellows, and a contribution of a maximum of £1000 to travel expenses and visa costs, payable after commencement of the fellowship in the UK.

The NEWS fellows are provided with desk space in the hosting institute and all the usual research facilities. The fellows are expected to play a full part in the activities of the hosting institute, and are encouraged to engage with the development of the NEWS India-UK nitrogen MOOC (Massive Open Online Course).

Offered Research Areas

Applicants are encouraged to choose a research topic from the list proposed by the NEWS India-UK partner institutes. Proposals from applicants for other topics are also welcome; however, these must be in close relation to one of the research areas offered by the hosting institutes and must have been pre-agreed with the intended host institution and team.

The proposed research areas can be found in the enclosed document.

Application procedure

The application form is enclosed to this document. When completed, it should to be e-mailed together with all the supplementary documents to the Secretary of the NEWS Fellowship Panel (Andrea.Moring@ed.ac.uk).

The NEWS Fellowship Panel members are:

- Prof. Altaf Ahmad
- Andrea Móring (Secretary)
- Prof. Himanshu Pathak
- Prof. N. Raghuram
- Prof. Dave Reay (Chair)
- Prof. Jo Smith
- Dr. Desiraju Subrahmanyam
- Prof. Mark Sutton

Application deadline: 30th June, 2016.

The Fellowship Panel selects and informs the awarded applicants by 31th August, 2016.

The next call is anticipated to be by 1st February, 2017.

References

- A minimum of two and a maximum of three confidential references are required.
- At least one referee should come from one of the Indian partner institutes: Aligarh Muslim University, Guru Gobind Singh Indraprastha University, Indian Agricultural Research Institute or Indian Institute for Rice Research.
- A letter of support from the UK hosting institute is required.
- Applicants should ask their referees to email their reference to the Secretary of the Fellowship Panel (Andrea.Moring@ed.ac.uk).

Notes for guidance

- Candidates must be Indian citizens, resident and pursue their scientific research in India
- Candidates for the Senior Fellowships will hold a doctorate and have at least 5 year post-doctoral experience, for the Junior Fellowship will pursue PhD studies or have less than 5 year post-doctoral experience.
- Candidates are required to prove their English language competence. Applicants for the Junior Fellowship have to make sure that in their confidential reference the NEWS India-UK referee confirms the applicant's high level of written and spoken English. Applicants for the Senior Fellowship should have a minimum of one year of working experience or studies in a native English speaking country or provide a list of peer reviewed publications written in English.
- Candidates will be expected to have been in communication with the researcher from the hosting institute with whom they intend to collaborate before applying, and to name the collaborator/mentor in their application. The collaborator must also provide a letter of support for the fellowship.
- Fellows are expected to be resident in the city of the UK hosting institute (Edinburgh or Aberdeen) throughout the tenure of their fellowship and to play a full part in the activities of the hosting institute. The hosting institute will be pleased to help with finding suitable accommodation in the city. The minimum tenure for a Fellowship is three weeks, the maximum is 6 months; applications for less than three weeks will not be considered. Fellows are expected to make their own travel and visa arrangements.
- Only fully completed applications will be considered. It is the responsibility of each applicant to ensure that all documentation is complete, and that referees submit their reports to the NEWS Fellowship Panel. Applications may include a copy of any one article or publication that is thought to be especially relevant to the research proposal and fellowship submission.
- The fellowship period can occur between 1st of October of the year of the application period and 30th September of the following year, depending on the requirements of the applicant and the availability of the hosting institute.

Criteria for evaluation

- The research proposed by the candidate fits to the project, balancing with the different components of the NEWS India-UK.

- The Fellowship Panel places considerable importance on the academic record and the publications of all applicants, as well as the quality of the submitted research proposal and/or the motivation statement.

Reporting

The awarded fellows should provide a short report of their fellowship within 6 weeks after returning to their home country. This report will include:

- a summary of the research outcomes,
- plans for exploitation and publication of the results,
- a short popular description of their experience, suitable to include to the NEWS India-UK blog.

Further assistance

For further assistance, please contact Andrea Móring, e-mail: Andrea.Moring@ed.ac.uk

NEWS INDIA-UK FELLOWSHIP

Application Form

Personal details

Title: Click here to enter text.

Name: Click here to enter text.

Date of Birth: Click here to enter text.

Photo:

Contact details

Home institution: Click here to enter text.

Address: Click here to enter text.

E-mail: Click here to enter text.

Phone: Click here to enter text.

English language competence

If you are applying for a Junior Fellowship, please make sure that your NEWS India-UK referee confirms in his/her reference the high level of your written and spoken English. If you are applying for a Senior Fellowship, please give details below about your work experience or studies in an English native speaking country (at least 1 year required) or examples of peer reviewed publications:

Click here to enter text.

Planned research

Is your planned research one from the research areas offered by the hosting institutes?

YES ☐ NO ☐

If you answered YES:

Please provide the title of the selected topic: Click here to enter text.

Please name the hosting institute: Click here to enter text.

Please name the collaborator at the research institute: Click here to enter text.

Please outline why you think you are an outstanding candidate for the selected topic (max. 500 words):

Click here to enter text.

When are you planning to carry out the research?

From: Click here to enter a date. **To:** Click here to enter a date.

If you answered NO:

Please provide a RESEARCH PROPOSAL below.

Summary of the proposed research (max. 50 words):

Click here to enter text.

Research proposal (max. 500 words):

Click here to enter text.

Importance of the research (max. 150 words):

Click here to enter text.

Relevance to the NEWS India – UK project and collaborative outcomes (max. 200 words):

Click here to enter text.

Please summarize why you think you are an outstanding candidate for the selected topic (max. 500 words):

Click here to enter text.

Please name the hosting institute: Click here to enter text.

Please name the collaborator at the research institute:

Name: Click here to enter text. **Email:** Click here to enter text.

When are you planning to carry out the research?

From: Click here to enter a date. **To:** Click here to enter a date.

References

Referee 1 (from the home institute)

Name: Click here to enter text. **E-mail:** Click here to enter text.

Referee 2 (from one of the Indian NEWS institutes, if Referee 1 is not from there)

Name: Click here to enter text.

Institute: Click here to enter text. **E-mail:** Click here to enter text.

Referee 3

Name: Click here to enter text.

Institute: Click here to enter text. **E-mail:** Click here to enter text.

Signature of the candidate:

Date of submission: Click here to enter a date.

Check list for the application:

- ✓ Curriculum Vitae enclosed.
- ✓ Publication list enclosed.
- ✓ Copy of the most relevant publication enclosed (optional).
- ✓ Make sure that the referees send their references confidentially to the NEWS Fellowship Panel, (if applicable) including confirmation of the English competence from the NEWS India-UK referee. (Andrea.Moring@ed.ac.uk).
- ✓ Make sure that the UK collaborator sends a letter of acceptance to the NEWS Fellowship Panel (Andrea.Moring@ed.ac.uk).

NEWS INDIA-UK FELLOWSHIP

Topics offered by the partner institutes for 2016-2017

Genetic mapping in rice

To include statistical analysis and bioinformatics interrogation of new data (from NEWS-India) and background data on the Rice Diversity Panel 1 or the Bengal and Assam Association Population, or other relevant data available with the Indian partners, for the purpose of identifying good candidate genes for traits especially related to grain quality such as grain ionome (e.g. arsenic, cadmium), and nutrient use efficiency such as shoot ionome (e.g. phosphorus, nitrogen).

Suggested length: 3-6 months

Contact: Prof. Adam Price (University of Aberdeen), a.price@abdn.ac.uk

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Assess rooting phenotypes in rice

Aberdeen have developed a very simple method to assess rooting depth (Al-Shugeiary et al. 2014, Annals of Applied Biology 165, 96-107). When using this method to assess hundreds of genotypes, we recommend confirming the success of the method using a rhizotron system on about 12 genotypes which allows multiple traits to be assessed. If anyone wants to learn these techniques, a visit of at least 12 weeks would be required during the Spring or Summer.

Suggested length: 3-6 months

Contact: Prof. Adam Price (University of Aberdeen), a.price@abdn.ac.uk

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Establishing the linkages between the functional microbial communities in the rice rhizosphere and the emissions of NOx and ammonia using the stable isotope probing (SIP) and isotope ratio mass spectrometry

The application of SIP and isotope ratio mass spectrometry for the Indian soils is very limited. Use of these techniques can help to establish the linkages between the emissions of NO_x and ammonia and those functional microbial communities. This information can improve the prediction of emissions of NO_x and ammonia from different soil types and the management options.

Suggested length: 3-6 months

Contact: Prof. Adam Price (University of Aberdeen), a.price@abdn.ac.uk. The topic is supervised by Prof. Liz Baggs and Dr. Nick Morely.

Investigating the impact of fertiliser type and inhibitors on the greenhouse gas fluxes from grazed grassland.

This study will provide training in greenhouse gas flux measurements of nitrous oxide, methane and carbon dioxide, using gas chromatography, and associated soil and vegetation measurements at Easter Bush. The field site is very close to the institute and ideal for short and long-term training

opportunities. Over the next two years our work will focus on the impact of fertiliser type, soil moisture and pH on the nitrous oxide, methane and carbon dioxide fluxes.

Suggested length: 1-6 months during the measurement period of April – October in 2017.

Contact: Prof. Ute Skiba (Centre for Ecology and Hydrology), ums@ceh.ac.uk

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Availability of organic wastes for soil improvement in India

Organic wastes provide a potential method for improving the fertility of soils in India by increasing organic matter content and by supplying additional nutrients. However, organic wastes are also used for other purposes, such as provision of energy, building or feeding to animals. The availability of organic wastes will be calculated using FAO statistics on animal numbers, crop growth and population. Other uses of wastes will be estimated using information published in the literature; this will be subtracted from the available organic waste. The potential to improve soil fertility using the remaining organic wastes will then be estimated using simulations of the RothC model.

Suggested length: 1-2 months

Contact: Prof. Jo Smith (University of Aberdeen), jo.smith@abdn.ac.uk

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Optimising use of organic wastes for maximum nitrogen use efficiency

Organic wastes can be applied untreated to the soil, or it can be treated by composting, anaerobic digestion or pyrolysis. These treatments affect the amount and availability of nitrogen in the organic waste. Information from the literature will be reviewed to determine losses of nitrogen during treatment of organic wastes in India, and the availability of nitrogen once the treated wastes are applied to soil. This information will be used to drive simulations of a simple model of nitrogen turnover and determine the consequences to efficiency of nitrogen uptake.

Suggested length: 1-2 months

Contact: Prof. Jo Smith (University of Aberdeen), jo.smith@abdn.ac.uk

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Lab studies to characterise and model the release of carbon and nitrogen during use of organic wastes

The release of carbon and nitrogen will be measured from differently treated organic wastes during incubation with soil. Carbon dioxide, methane and nitrous oxide emissions will be measured. Changes in nitrate and ammonium concentration will also be measured. Measurements will be done for soil incubated with untreated wastes, composted wastes, the bioslurry residue from anaerobic digestion, and pyrolysed organic waste. If possible, samples of these wastes will be brought from India. This information will be used to derive parameters for the RothC and ECOSSE models.

Suggested length: 6 months

Contact: Prof. Jo Smith (University of Aberdeen), jo.smith@abdn.ac.uk and Dr. Saran Sohi (Univeristy of Edinburgh), Saran.Sohi@ed.ac.uk

Lab studies to characterise and model the release of carbon and nitrogen during treatment of organic wastes

The losses and transformations of carbon and nitrogen during treatment of organic wastes will be measured. Carbon dioxide, methane and nitrous oxide emissions will be measured. Changes in nitrate and ammonium concentration in the wastes will also be measured. Measurements will be done during composting, anaerobic digestion, and pyrolysis. If possible, samples of organic wastes will be brought from India, and treatment methods will attempt to emulate processes occurring in India. This information will be used to derive parameters for the RothC and ECOSSE models.

Suggested length: 6 months

Contact: Prof. Jo Smith (University of Aberdeen), jo.smith@abdn.ac.uk and Dr. Saran Sohi (Univeristy of Edinburgh), Saran.Sohi@ed.ac.uk

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Improving the representation of double cropping (e.g. rice-rice and rice-wheat) systems in the Cool Farm Tool

The Cool Farm Tool produces annual GHG emissions estimates, and thus is currently more adapted to production systems in which one crop per year is grown. There are is work in progress at the moment to improve the accounting for perennial crops but systems in which more than one crop per year is grown (e.g. rice-rice, rice-wheat) could also be improved. This fellowship would establish a practical model to predict the emissions from sub-annual crops and develop metrics to assess both single and double cropping systems in useful way. It could inform subsequent fellowships.

Suggested length: 1-3 months

Contact: Dr. Jon Hillier (University of Aberdeen), j.hillier@abdn.ac.uk

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Biomass pyrolysis in N management *(Senior Fellowship)*

As part of core activities in NEWS, the potential for biomass pyrolysis in N management could be can be scoped for the Indian context. Typologies could be defined for farming systems where pyrolysis offers potential viability and greatest likely benefits to the efficiency of N use. A commercial context might be identified, as a route to eventual wide scale deployment. A set of proposals could be written to investigate specific questions that enable demonstration of biochar fertiliser products under key scenarios, also their integration into soil and farm-system models (in other NEWS activities, involving other partners and/or Fellows).

Suggested length: 1-2 months

Contact: Dr. Saran Sohi (University of Edinburgh), Saran.Sohi@ed.ac.uk

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Biochar designed for fertiliser function *(Junior Fellowship)*

The context in which biochar use should deliver overall N benefit better than alternative options will have been defined elsewhere. In this Fellowship biochar designed for the specific fertiliser function

will be manufactured at laboratory scale, as composite products of defined chemical ingredients, specific structural characteristics and ageing patterns. Optimal function will not be achieved through full factorial experiments, but constrained by shortlisting based on existing insights. Functionality under field conditions would involve later NEWS activities or initiatives within India (years 2–3). In the Fellowship indirect methods will be used: a set of laboratory assays established in Edinburgh in the past few years.

Suggested length: 3-6 months

Contact: Dr. Saran Sohi (University of Edinburgh), Saran.Sohi@ed.ac.uk

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Dynamics of N in the rhizosphere around biochar composites *(Junior Fellowship)*

Some measures of interaction between crop roots and biochar were obtained in earlier work. In that work pure biochar particles were used. In this Fellowship, the dynamics of N in the rhizosphere around biochar composites will be examined: biochar carrying exogenous N and/or biofilms for delivery / proliferation at plant root surfaces. Mechanistic insights into N exchange at the root interface will support the modelling of biochar in the soil N cycle alongside chemical fertiliser, straw, compost and manure (etc.) in other NEWS India activities.

Suggested length: 3-6 months

Contact: Dr. Saran Sohi (University of Edinburgh), Saran.Sohi@ed.ac.uk

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Biochar application in the management of manures and/or composts *(Junior Fellowship)*

Effects on nitrous oxide and ammonia emissions from liquid manure observed in earlier published work (in storage and after land spreading). This fellowship will examine biochar selection for use of biochar into the management of manures and/or composts for direct application to land. This will contribute to the whole-system modelling activities in NEWS.

Suggested length: 3-6 months

Contact: Dr. Saran Sohi (University of Edinburgh), Saran.Sohi@ed.ac.uk

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Interactions between N supply and ozone exposure (*Junior Fellowship*)

The fellowship provides the opportunity to analyze plant responses to the interaction of nitrogen supply and ozone exposure, though use of a field experiment. The focus of the measurements of this project may depend on the interests of the fellow, and range from plant and soil measurements, to the testing of novel indicator approaches. This project would fit most effectively to a fellowship during the summer field season (i.e. April to September). The project would suit a Junior Fellow and provide training in field experimentation and the running of field fumigation experiment using free air enhancement of ozone and ammonia.

Suggested length: 2-3 months during the summer field season (April to September 2017)

Contact: Prof. Mark A. Sutton (Centre for Ecology and Hydrology), ms@ceh.ac.uk

Testing a new micrometeorological approach for non-invasive ammonia flux measurement in field plots

The project will apply well-established chemical batch sampling methods (ALPHA samplers as developed and used widely by CEH) into a plot approach combined with inverse dispersion modelling (FIDES model, windtrax) in a grid approach as a basis to estimate ammonia emissions from replicated plots. This approach is designed to complement the existing chamber based methodology, and may also be tested along-side that approach on return to India.The fellowship is expected also to include cooperation with Dr. Benjamin Loubet of INRA Grignon, near Paris. The project will require chemical both field measurements and measurement of ammonium in the chemistry laboratory, providing training in the operation and analysis of ALPHA samplers, and also training in the application of a micrometeorological dispersion method.

Suggested length: 2-3 months during the summer field season (April to September 2017)

Contact: Prof. Mark A. Sutton (Centre for Ecology and Hydrology), ms@ceh.ac.uk