When one turns to the history of quasicrystals, the Indian contribution that followed Shechtman's discovery cannot be overlooked. Indian scientists relish the fact that something that was important and studied elsewhere was being worked on in India from the beginning[10]. Studies on quasicrystals were carried out at the Indian Institute of Science (IISc), Banaras Hindu University (BHU), Indian Institute of Technology-Kanpur, Bhabha Atomic Research Centre, Indira Gandhi Centre for Atomic Research and the Defence Metallurgical Research Laboratory.

S. Ranganathan[11,12] (IISc) a metallurgist who had the same Ph D mentor as Shechtman (D. G. Brandon, though in different times and places) has been working on quasicrystals since 1985. Kamanio Chattopadhyay (IISc) and Ranganathan discovered decagonal quasicrystals in 1985. P. Ramachandra Rao and G. V. S. Sastry (BHU) produced a new type of quasicrystal in Mg–Al–Zn alloy in 1985. Rao and Sastry published a paper on 'the basis for selection of alloy systems that yield quasicrystals' in an Indian journal[13], and demonstrated the validity of the basis in Mg–Al–Zn alloy[14]. The same basis was shown to be valid in the case of the Mg–Cu–Al system as well[15]. According to Sastry[14], this contribution is noteworthy because efforts prior to this after Shechtman's discovery were all aluminum–transition metal-based. These discoveries are a glimpse of the Indian contributions to quasicrystallinity. There is much more to it.

Mathematician Eric A. Lord (co-author of the book *New Geometries for New Materials*, Cambridge University Press, 2006, with Alan Mackay and S. Ranganathan) wrote an article for beginners on quasicrystals in this journal long ago[16]. When asked about his reactions to the Nobel for the discovery of quasicrystals, Lord expressed, 'There are not many applications of quasicrystals. Usually the Nobel Prize Committee is looking for something that is very useful'[17]. Balaram[2] writes in his editorial, 'New cooking surfaces and hardening steels are hardly applications likely to excite the Nobel committee'. Then what makes quasicrystals a Nobel-winning finding? 'Quasicrystals were fascinating to everybody, not just to scientists but those who read magazines and enjoy patterns', says Lord[17]. Ranganathan takes pride in saying that, 'Quasicrystals changed our knowledge about how matter is organized. It is an understanding just like understanding the structure of an atom or the structure of universe'[11].

The President of the International Union of Crystallography, Gautam Desiraju (IISc), is of the opinion that 'this Nobel Prize is all about crystallography ... it is a Prize for crystallography'. According to Desiraju, the Nobel to Shechtman also leaves a message for young researchers: 'Some of the time-tested old-fashioned values are re-emphasized by this particular Prize … . You do science for curiosity! If you are prepared well for an experiment, you see any result even though it might counter everything you have learnt before. So this Nobel Prize teaches you experimental rigour and the importance of rigour. It also tells to do your work without worrying about the predecessors'[10].

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MEETING REPORT

YETI, in Guwahati*

When I was a postdoc, I used to frequently visit webpages of Indian research institutes where I intended to apply for a faculty position. It was then that I first found out about a student ecology conference named YETI, Young Ecologists Talk and Interact (YETI is also an elusive and likely a fictitious primate). Apart from that fact that it was encouraging to see an in-house ecology conference in India, what struck me was that it is an academic event that is organized and run entirely by, and for, students of ecology. Within a few months of taking up a position at the Indian Institute of Science, Bengaluru I got an opportunity to see this highly energetic ecology student crowd when they invited me to conduct a workshop on mathematical modelling in ecology.

The idea to create such an interactive forum for young researchers of ecology was conceived among the student community of Bengaluru in 2008, which is not surprising given the city's reputation as a key centre of research in ecological sciences in India. Following the success of a small-scale event that restricted

*A report of the conference on 'Young Ecologists Talk and Interact' (YETI 2011).

itself to local students, YETI was born in 2009 as a full-fledged national conference for students and researchers across India, with active support from various research institutions in the country. Since then it has quickly grown in both size and content, with the participant numbers increasing from 100 to more than 400, with panel discussions and many new workshops having been added. Having left its mark in its hometown, the young but matured YETI took a huge leap in its latest edition in December 2011 move to Guwahati, Assam.

Even before the conference began

The zeroth day of the conference had pre-conference workshops designed to familiarize students at their advanced stage of Ph D degree to a number of soft as well as technical skills. A key part of research work is to tell your peers what you have done, and to convince them of its importance. I still remember how clueless I was when I prepared my first presentation, and the nervousness I had to overcome on the day of the presentation at a big conference like this one. I was fortunate to have good mentors to guide me, but that is not always the case. To address such concerns, which are extremely common among graduate students, the pre-conference day started with a talk by Yateendra Joshi, author of a famous book *Communicating in Style*, on preparing presentations that make an impact on the audience. Following the talk, each student had an opportunity to interact and take guidance from either an experienced Ph D student, a postdoc or a faculty who was present at the conference. I had a great time interacting with two students from the northeastern part of India, listening to the impressive work they had done and trying to help them improve their presentations that were due a day later.

The later part of the day had many useful sessions such as managing datasets and bibliographies, scientific writing as well as an interesting and interactive session on ethics in doing science. These sessions also gave opportunity to raise unique issues faced by the students of the North East (NE) and how they can address them as individuals as well as collectively. YETI being a forum that is by and for students was a right place to raise their concerns fearlessly. Notwithstanding the foggy and cold Guwahati winter, these debates did occasionally raise the temperature. Of course, the heat never lasted for long. In one instance, a student said everyone in this meeting other than the three professors on the dais was young. This had the entire audience in laughter and made the few older people in the audience feel light hearted and young!

Putting ecology and behaviour in a theoretical and quantitative framework

S. K. Barik (Northeastern Hill University of Shillong) formally kick-started the three-day long event by talking about dynamics of forest gaps and ecological succession which he has studied in the northeastern forests for over two decades. He emphasized that students of ecology should strive to make their studies more quantitative and base them on sound ecological theories. This aspect was repeatedly echoed by all other speakers in different contexts and was reflected in the various workshops that were an important part of YETI. The topics of plenary lectures included biogeography by my colleague Kartik Shanker (CES, IISc), individuality and sociality of bonnet macaques by Anindya Sinha (NIAS, Bengaluru), gene and environment interactions by Deepak Barua (IISER, Pune), and on behavioural experiments on crows and cuckoos in the field by Suhel Quader (NCBS, Bengaluru).

Learning hands on through workshops

While talks by established researchers gave a broad overview of topics in ecology, animal behaviour and conservation, a range of workshops offered participants an opportunity to learn important research techniques. These were conducted typically in small focused groups that enabled hands-on learning as well as closer interaction with the instructor. They covered various topics, including (i) quantitative ones such as basic statistics, GIS and mathematical ecology, where students used computers and/or calculators to get a feel for models and techniques, and how to make connections to ecological research with them; (ii) basic issues arising in designing research studies in ecology, animal behaviour and conservation, and (iii) soft skills such as preparing presentations, getting the most out of scientific papers, and how to do good photography while studying wildlife, etc. All these workshops were highly sought after by the students.

I had an enjoyable experience working with students in the workshop 'Ecology through numbers'. Two major aims of this workshop were to show that simple mathematical models can provide new insights to our understanding of ecology, and to make an attempt at removing the barrier between mathematics and biology that most students have. To achieve this I took the approach of working with students, rather than lecturing them, in building and analysing a simple mathematical model (known as logistic model) of population dynamics. In fact, they did most of the work, using calculators and playing with numbers, discussing among themselves, while I interacted with them only as and when needed. I am not sure if we fully achieved the goals of the workshop; but I am reasonably sure that many students were delighted when they discovered an unexpected result, on their own, that populations can exhibit cyclic behaviour even if external conditions remained constant (for those familiar with the literature, it is called 'period doubling bifurcation').

Student presentations

YETI is not just another conference where students come and listen to experts. A major part of the conference involved presentation of research work done by students through posters, speed talk-cum-posters and oral presentations. In all, there were 42 posters, 27 speed talk-cum-posters and 45 oral presentations. Although a vast majority of students were presenting their research work for the first time, I was impressed at the clarity with which they conveyed the motivation for their study, specific aims and methods employed as well as their key results to the audience. The pre-conference workshops did seem to have helped many of the first timers. Students covered a remarkable array of topics and geographical areas of study, from those on plants visited by hummingbirds of Peru, to how songs of birds can be used to study population structure across geographic gaps of the Western Ghats, to the

biodiversity and conservation issues pertaining to NE India.

Focus North East

The focus on NE India was most evident with a large number of students (about 70%) presenting their research work from the region. Naba Jyoti Bora (Assam University, Silchar) explained how a weed plant, *Ageratum conyzoides* L, widely prevalent in agricultural fields of NE India inhibits growth of vegetable crops. Kamal Azad (Aaranyak, Assam) spoke on his group's effort to estimate tiger population in Orang National Park, Assam. There were also talks related to other parts of NE, such as on recording avifauna and threats to them (poaching and hunting) in Mizoram and assessment of butterfly diversity in Tripura.

In addition, several popular talks and discussions were focused on the relatively neglected issues pertaining to the NE. Aparajita Dutta (Nature Conservation Foundation) led a panel discussion on community-based conservation to come up with strategies for conservation in NE India. Ravi Chellam (Madras Crocodile Bank, Chennai) emphasized the need to acknowledge the cultural diversity within the NE region for developing any successful paradigm.

In one of the popular talks, Abhijit Das (Aaranyak) took the audience through a colourful pictorial journey showing the natural history and biodiversity of amphibians and reptiles of NE India. In another popular talk, Ramana Athreya (IISER), a physicist cum natural historian who has been credited with the discovery of a new species of bird (*Bugunliocichla*) in Arunachal Pradesh, presented an inspiring tale of his group's efforts in setting up a successful community-based conservation project involving eco-tourism in Eaglenest, Arunachal Pradesh.

Discussions and the road ahead

YETI also offered a forum for discussion on a number of topics both formally (through pre-planned panel discussions) and informally. A panel led by R. Prabhakar (Standard Life Sciences, Bengaluru) focused on open data sharing, and how one can contribute to it. The idea of sharing data collected based on funding from public sources is being pushed forward in various countries in the world. But it was recognized that a major challenge is to make the open sharing attractive to scientists who may have spent years, and sometimes decades, collecting data.

Despite the conference starting at 7 am in the morning and running late into evening, sometimes up to 10 pm, all sessions were well attended. Other salient features of this workshop include that the youngest participant was a high-school student from Tamil Nadu. YETI also had a couple of international participants this year.

Considering how the YETI team, which is largely based in Bengaluru, managed to overcome many difficulties involved in organizing an event of this scale at a distant location, I think that YETI at IIT-Guwahati was remarkably successful by any measure. Notwithstanding the success of the event, every evening during the conference, students got together informally to discuss various issues, from nitty-gritty details of how the conference organization can improve to broader issues on the future of YETI. It was felt that YETI should not just be a conference, but a wider platform for young ecologists in India by adding other activities such as conducting longer workshops that focus on special topics and building an on-line repository of various resources related to ecology.

The fact that the YETI webpage (http://meetyeti.in/) turns up as one of the first few results if you google 'student ecology conference', emphasizes its uniqueness and importance in the growing ecology community in India, and how, in the future, it may potentially play a leading role for the rest of the student community in the world. Its positive impact was most evident with various groups from across the country, including Delhi, Pune, Kolkata, Kerala and Guwahati coming forward to volunteer to host the next edition of YETI at their location. Finally, to keep the momentum that has been generated at a relatively remote part of India, and to increase further participation from the NE states, students seem inclined to hold YETI at Guwahati in 2012 as well. I am sure everyone will be happy to be back at Guwahati again.

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