

## VATLY NEWSLETTER



*“In the context of stormy scientific and technological development, especially information technology, our young generation is now equipped with better knowledge, frequent internet access for exchanges, learning, discovering and observing. This generation has played and will play a decisive role in the country’s development and future. It represents both pressures and advantages for us to enhance democracy and institutions.”*

*Prime Minister Nguyen Tan Dung  
2014 New Year’s Message to the Vietnamese People*

### CONTENT

This nineteenth issue of the **VATLY NEWSLETTER** opens with the traditional **NEWS FROM THE LABORATORY**. Diep and Phuong report on **RECENT RESULTS USING THE VATLY RADIO TELESCOPE**, Thao on the **THE FIRST NARIT-KASI WINTER SCHOOL**, Phuong on **A WEEK IN BANDUNG**, Tuan Anh on his **LAST STAY IN TOULOUSE**, Hoai and Nhung on their stay in **AUTUMN 2013 IN PARIS**, Pierre on a school and a conference that covered **TWO WEEKS IN QUY NHON**, Diep on **PROMOTING ASTRONOMY IN SOUTHEAST ASIA** and Dong on a **NATIONAL NUCLEAR CONFERENCE IN VUNG TAU**. The issue

closes with an editorial from Pierre entitled **THE COURAGE OF FACING THE TRUTH**, followed by the **PHOTO ALBUM**.

### NEWS FROM THE LABORATORY

*Under this heading we review briefly the progress of the work of the team and the main events in its life.*

For most of the time covered by the present issue (September to December 2013), Tuan Anh, Nhung and Hoai were away in France; Tuan Anh in Toulouse for his third and last cotutelle stay, Hoai in Paris for her second, together with Nhung who joined her in Thibaut Le Bertre’s team (on this occasion, both spent a week in Leiden at a workshop on the interface between stars and

interstellar medium and Hoai attended the yearly IRAM school on single dish radio astronomy in Granada). Those of us who did not go to France took part in a number of conferences and schools: the whole team in Quy Nhon, Dong and Thao in Vung Tau, Diep in Bangkok, Diep and Phuong in Bandung, Diep, Dong, Thao and Phuong in Chiang Mai. Most of these events are commented later on in the issue. An important event in our life has been the presence of Pierre Lesaffre and his family in Viet Nam, who has been spending much of his time with us.



*Hoai, Diep and Tuan Anh at ICISE*

In the wake of the Quy Nhon Conference, Diep had the pleasure and honour to guide Shelly Glashow in Ha Noi and across Ha Long Bay. Shelly repeated his Quy Nhon presentation at the University of Science and Technology. The title, *A parable of the Pure and the Practical: Why we must pursue basic scientific research*, tells well what it was about... let us hope that it has been heard by some.

While in Ha Noi, our work has been mostly dedicated to solar observations using our radio telescope. As reported in the last issue of our Newsletter, we had observed solar oscillations at the percent level and with periods in the 5 to 7 minutes range, and their analysis in comparison with similar observations by the Australian Learmonth Observatory had triggered sufficient interest among experts to justify a publication in Solar Physics. We thought that the oscillations were somehow related to solar activity and multipath in the ionosphere, but we had no solid evidence for it. We have now clearly established

that their cause is purely instrumental: it is due to interferences between the direct signal received in the main antenna lobe and its specular reflection on ground received in a side lobe. Such an effect, called multipath, had been considered earlier but the presence of correlations between the observations made in Ha Noi and at Learmonth was thought to argue against it. We have now established that such correlations are indeed expected and that their main features match very well our observations. The effect is amusing enough to justify a brief report by Diep and Phuong elsewhere in the present issue.



*Phuong and Diep visiting Bosscha Observatory*

We heard seminars from Pierre Lesaffre on *bow shocks*, from H.C. Thiem on *CMB Foregrounds in the Planck Era: Emission and Polarization by Spinning Nanodust Grains*, from A. de la Macorra on “*bound*” dark matter, from D.T. Khoa on *early universe and the origin of the elements*, from G. Patanchon on *recent Planck results*, from Rogel Mari Sese on his efforts with promoting astrophysics in the Philippines. The latter was particularly interesting when compared with what we are trying to achieve in Viet Nam. Rogel got a PhD in astrophysics in Japan and returned to the Philippines with the idea to promote astronomy and space science in the country. A very dynamic and energetic character, he created his own company to give advice and produce services related to astronomy. He took advantage of the educational system being changed in the Philippines from 10 years to 12 years total cursus to play a leading role in introducing space science at all levels of

education, from Kindergarten to high school. He provided the authorities with advice and planning as well as services and material, software and hardware, aimed at facilitating this introduction. He also dedicated much time and effort to develop public outreach initiatives, being convinced that triggering public interest was essential to obtain support from the authorities. He is now recognised in the country as a leading figure in education and space science and has gained confidence and support from the Government to achieve his goal. While the Vietnamese context is similar to that in the Philippines in terms of public awareness and availability of competences, the hope for getting attention and support from the Government is probably much weaker in Vietnam. Yet, Rogel's success story sets a good example for us to follow.



*Singer Trang accompanied by Pierre at the piano*

As usual, we had the honour to invite a few guests for occasional lunches, including Pierre Encrenaz who spent some days at USTH, Didier Lecomte, responsible for R&D at USTH, Daniel Rouan, astronomer in Meudon, head of the doctoral school at Observatoire de Paris (to which Hoai belongs), Van Thanh and P.T. Lê from Tia Sang with whom we discussed about the future Science Day to take place in Ha Noi in May 2014. The latter was also an opportunity to introduce Pierre Lesaffre to them, not only as a brilliant physicist but also as an outstanding pianist. In the wake of this, a concert took place just before Tết. Indeed, Tia Sang has a tradition of organising concerts in a coffee bar visited by Hanoian intellectuals and often the scene of cultural events. Pierre performed on the piano, a little jewel by Couperin followed by a few Chopin's pieces, and accompanied two young singers of Ha Noi's Academy of music, giving a performance of

exceptional quality that was highly applauded by the audience.

We had the good fortune that IAU, the International Astronomical Union, retained our proposal for the organization of a radio astronomy workshop in Ha Noi with financial support at the level of 2500 euros meant to cover the participation of foreign astrophysicists. The workshop will be held in the premises of our Institute between April 7<sup>th</sup> and 11<sup>th</sup>, 2014. The idea is to exchange information on ongoing and future research projects and to foster closer contacts and possible future collaborations. Participants will include the few of us doing active research in Viet Nam: Dinh Van Trung from the Institute of Physics in Ha Noi, Phan Bao Ngoc from the International University in Ho Chi Minh City, the whole VATLY team as well as Nguyen Quynh Lan and Cao Anh Tuan from the Universities of Education in Ha Noi and Sai Gon and Dao Tien Khoa from our institute. From abroad, we will have the honour of the participations of Di Li, Young Chol Minh and Thibaut Le Bertre. Thibaut, co-supervisor of Hoai's PhD thesis, is well known to the readers of the Newsletter. Di Li, whom we first met in Quy Nhon this Summer, after fifteen years spent in the States, in particular using the giant Arecibo radio telescope, is now a chief scientist in the Radio Division of the National Astronomical Observatories of China with leading responsibilities in the Five-hundred-meter Aperture Spherical radio Telescope (FAST) project. Young Chol Minh, whom Diep and Dong met in Chiang Mai, is the President of the Korean Astronomical Society and is doing research at the Korean Astronomy and Space Science Institute (KASI) on molecular radio astronomy. We also will hear a presentation by Pham Anh Tuan, Director of the Vietnam National Satellite Centre in Ha Noi, about the Vietnamese Space program.

Our contributions to teaching have kept increasing. Nhung and Diep give a series of introductory lectures on general astrophysics at the Ha Noi Universities respectively of Sciences and of Education. At USTH, we contribute to the Master on Space and Applications, in particular with support to lab work and tutorials by Dong, Diep, Thao and Nhung. The attendance has dramatically decreased this year, to the level of

only four master students, resulting in part from the high tuition fee. This alarming situation is not tenable and requires taking major steps in the future. In January, the master 2 students took part in a water rocket competition that had been organised jointly by VAST and Japan and which a few of us attended.



*Pierre Lesaffre, Pierre and two USTH master students at the water rocket competition*

A happy event was the Vietnamese wedding of Huyen and Alain Maestrini in Ha Long on January 17<sup>th</sup> and 18<sup>th</sup> in Huyen's family place, to which the whole team took part, including Pierre Lesaffre and his family. Alain's parents had come to Ha Long for this occasion and enjoyed witnessing and sharing the delight of all their friends having come there to wish them many years of happiness.

Other events in the life of the laboratory include the award to Nhung and Phuong of Odon Vallet fellowships, thanks to the support of Rencontres du Viet Nam, for which they are deeply grateful; the presentation given by Cuc of her dissertation, for which she obtained a high mark; a visit of Pierre Lena to Ha Noi with the aim of promoting *La Main à la Pâte*, an international programme meant at bringing science to school at an early stage; a visit of Jean-François Bach and Daniel Ricquier aimed at establishing closer contacts between the French Academy of Sciences and the Viet Nam Academy of Science and Technology.

This report would not be complete without including a brief mention of the death of General Vo Nguyen Giap who died on October 4<sup>th</sup> at the

age of 102 after having spent four years in the hospital in a physically weak but mentally healthy state. His funerals were the occasion for many thousands of Vietnamese, standing in queue in kilometre long files, to pay tribute to a man who was for them the last living symbol, after Ho Chi Minh, of the revolutionary ideal of independence, freedom, integrity and justice for which the nation had fought for such a long time. Pierre had had the honour of meeting General Giap several years ago, on which occasion he had been encouraged by him to "keep fighting for better universities in Vietnam".

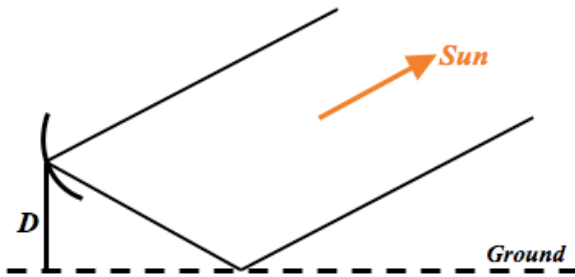
### **RECENT RESULTS USING THE VATLY RADIO TELESCOPE**

*P.N. Diep and N.T. Phuong have worked on the collection and analysis of new solar data and report on the outcome.*

In the middle of the last century, in the wake of observations made by Navy officers during World War II, according to which the radar echo of a plane flying near horizon above the ocean is modulated by interference fringes, Australia was the home of the founding fathers of radio interferometry and the site of pioneering observations using the so-called "sea-cliff interferometer". The principle of the method was to observe a radio source as it rises above the horizon with a single antenna located on top of a cliff above the ocean; the direct wave and its reflection on the water surface interfere and produce interference fringes that allow for considerably improved angular resolution with respect to what was possible at that time. Observations of solar spots, soon followed by observations of various radio sources, have then been reported.

Sixty-five years later, we observe an illustration of the same mechanism causing correlations between apparent solar oscillations simultaneously detected by two distant radio telescopes respectively located in Ha Noi and at Learmonth, on the north-western Australian coast. In our case, oscillations are not observed on the rising Sun but at large elevations: the reflected wave reaches the antenna in one of its side lobes, at large angle with respect to the beam. As a result, the oscillations have amplitudes of a few

per mil, rarely exceeding 1%. Reflections occur on the ground surrounding the antenna and the periods of the oscillations are in the range of a few minutes. The intriguing existence of correlations between the Ha Noi and Learmonth observations, first considered as an argument against a possible instrumental effect, is now clearly understood as being purely instrumental.

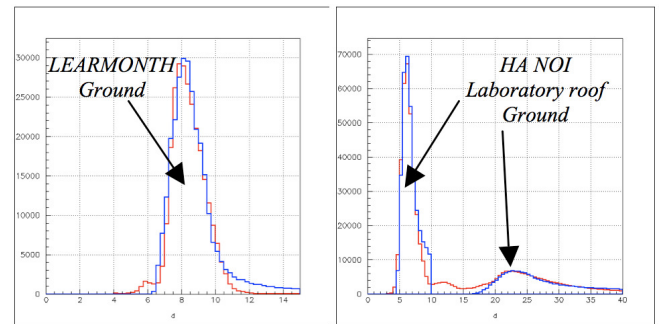


When the Sun moves across the sky, the path difference between the direct and reflected waves varies accordingly, giving rise to interferences with period  $T$  measured in units of the ratio between the height  $D$  of the antenna above ground and the wave length  $\lambda$ , here 21 cm. At equinox and for two antennas at opposite latitudes  $\pm\phi$ , which is the case of Ha Noi and Learmonth,  $T = 1/2\lambda(D\cos\phi\sin i)$  where the time  $t$  is measured with respect to when the Sun crosses the meridian plane (so-called hour angle). At noon,  $t=0$ , the elevation of the Sun is stationary and there are no oscillations ( $T$  is infinite). Seasonal variations are very small. Two antennas at the same height  $D$  and the same longitude would therefore simultaneously observe identical oscillations. As Learmonth and Hanoi differ in longitude by only  $8^\circ$ , the main parameter of relevance is therefore the height of the antenna above ground which can be reconstructed from the data under the hypothesis of specular reflection. The correlation observed between Ha Noi and Learmonth data is easily identified this way as resulting from reflections on the roof of the laboratory and on ground respectively as illustrated from the figure below. Note that in winter, when the Sun is low in Ha Noi it is high in Learmonth, and conversely in summer; however, this does not affect the periods of the oscillations, only possibly their amplitudes. The study of the phases of the observed oscillations provides an

independent confirmation of the validity of the results obtained from the study of their periods.

Sixty-five years later, Australia is again the scene of a multipath episode reminiscent of the sea-cliff interferometer, of course much less glorious but as enjoyable an experience for us as it must have been for the pioneers of radio interferometry, J.G. Bolton and G.J. Stanley.

We take this opportunity to thank the Learmonth Solar Observatory staff, who are making their data available to the public, and particularly Dr Owen Giersch for having kindly and patiently answered many of our questions related with such data and, in particular, for having first mentioned a possible contribution of multipathing. We are also grateful to Drs Alain Maestrini, Pierre Lesaffre and Alan Rogers for many useful comments.



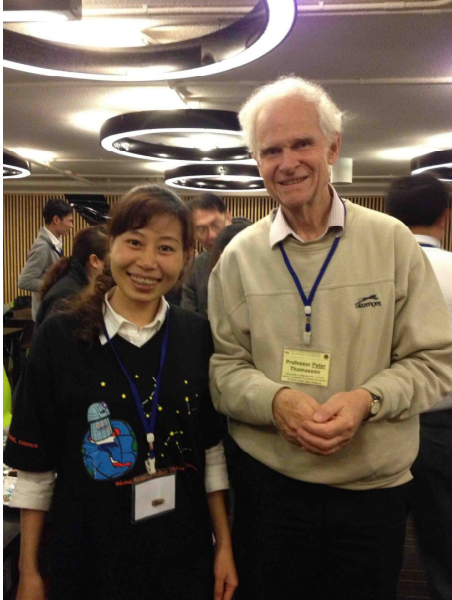
$D$  distributions (red) obtained from the data under the hypothesis of specular reflection. The blue lines show model predictions. The second peak in the Ha Noi case is from reflections on ground (on the tennis court behind the institute building).

### THE FIRST NARIT-KASI WINTER SCHOOL

Thao reports on her stay, together with Diep, Dong and Phuong, in a winter school on radio astronomy in Chiang Mai (Thailand).

Radio astronomy has developed remarkably in the past decade or so, and many important new discoveries have been made. In Asia, India, Australia, China, Korea and Japan have been active for many years but, more recently, Thailand, Malaysia, Indonesia, and Vietnam have started working on radio astronomical research and instrumentation. This is the context in which the South East Asia Astronomical Network (SEAN) had been established with, in its wake, the South East Asian

Young Astronomers Collaboration (SEAYAC). In the last week of January 2014, the National Astronomical Research Institute of Thailand (NARIT) and the Korea Astronomy and Space science Institute (KASI) organized the first winter school on an introduction to radio astronomy in Chiang Mai, Thailand's second largest city.



*Thao and Peter Thomasson (Jodrell Bank, University of Manchester) at the Chiang Mai school*

Ignoring the news of serious disturbances in the streets of Bangkok that were reported in the media, we decided to reach Chiang Mai two days before the school started in order to discover a city that was new to us. Chiang Mai is famous for his rich collection of old Buddhist temples, of which we visited a few. We took the time to tour the surroundings of the town, riding elephants and drifting along Mae Tang River on bamboo rafts.

The school lasted only four days during which, however, it managed to introduce us to the basics of contemporary radio astronomy, with particular attention to research projects such as the Square Kilometer Array (SKA), the Korean Very long baseline interferometry Network (KVN) including three 21m antennas, more than 300 km apart from each other and operated at four different frequencies, the Taeduk Radio Astronomy Observatory (TRAO) and the Very Large Array (VLA). On each of these, reports were given by lecturers active in the project that they were presenting. Moreover, the school

provided opportunities for students to interact with lecturers in small working groups, lab sessions and hand-on tutorials. Students were encouraged to learn about the recent radio astronomy developments in Korea, Thailand, Malaysia, the Philippines, Indonesia, and Vietnam and to identify future areas of development. In addition, students also discussed postgraduate training opportunities with several professors. Each evening was an opportunity to get together for a drink or a walk in the city. We also had a chance to spend a night at the 2.4 m optical telescope of the Chiang Mai observatory on Doi Su Thep. On this occasion, we learned about each other experience and activities. I enjoyed meeting again astronomer friends whom I had met last year in Malaysia and hearing from them that they had successfully installed the 7m radio telescope in University Malaya. I learned a lot from the school and I hope that it will replicate in the future. It is a pleasure to thank the organizers and our Thai friends wholeheartedly for their warm hospitality.



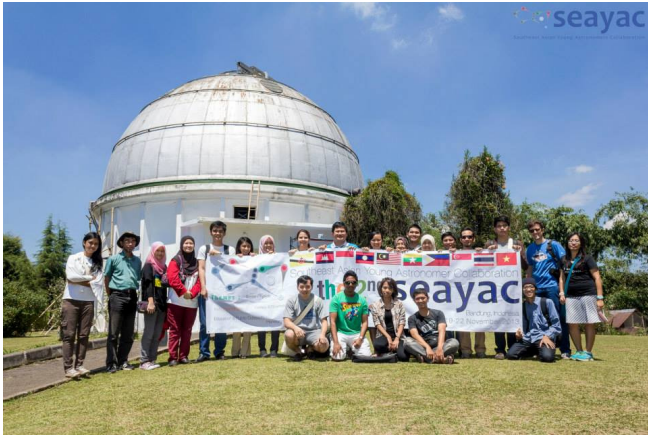
*Phuong, Thao, Dong and Diep in a restaurant inside an orchid garden in Chiang Mai*

### **A WEEK IN BANDUNG**

*P.T. Phuong reports on the week she spent in Indonesia, together with Diep, in a meeting gathering young astronomers from Southeast Asia.*

Last year, from November 19<sup>th</sup> to 22<sup>nd</sup>, I had a chance to attend the 2<sup>nd</sup> meeting of the Southeast Asian Young Astronomers Collaboration (SEAYAC) in Bandung, Indonesia. It was my first journey out of my native country. The aim of the

meeting was to provide a venue for SEAYAC members to present their current research and to interact with colleagues from other countries. The topics discussed during the meeting extended in a quite broad spectrum from planetary systems, solar physics and stellar physics to galaxy and cosmology. Besides, the instrumentation for astronomy research and education and public outreach were also discussed.



*SEAYAC group photo in front of the central dome of Bosscha Observatory*

The meeting attracted about 50 participants from Indonesia, Malaysia, the Philippines, Thailand and Vietnam. In addition to the young participants there were some invited speakers from the United States, Netherlands and Indonesia. From Vietnam, there were only Diep and I attending the meeting.

In the first two days, we had four lectures given by invited speakers in the first sessions (whether morning or afternoon) and presentations by other participants in the following session. I found all the lectures and talks very helpful and interesting. I learned a lot about astronomy and their instrumentation. At the meeting, I presented our recent studies about solar oscillations using the VATLY radio telescope and Diep gave a talk about “*Research at VATLY*”. The third day of the meeting was devoted to two workshops on astronomy education and public outreach, led by two astronomers from the Netherlands and the United States, both of them quite popular figures in this domain. Pedro Russo is a Portuguese astrophysicist (now working at Leiden Observatory, the Netherlands), global coordinator

of the International Year of Astronomy 2009 and chair of an IAU Division on Public Outreach Information Management. Pamela L. Gay is an American, assistant research professor at Southern Illinois University, Edwardsville, educator, podcaster, and writer. She is best known for her work in astronomical podcasting and citizen science astronomy projects. They talked about the projects which they are carrying out and shared with us their experiences in communicating on astronomy to the public. They explained how to make a public outreach event, gave keys to write a research article and a press release and how to manage our time and research work using free assistant softwares. In the workshop led by Pedro Russo, we gathered in small groups to do a common small project: write a press release, make a public outreach video, persuade authorities to support an astronomy project in the Southeast Asia region... The task of my group was to write a press release. Pedro created an exciting environment to discuss among the participants and gave us the opportunity to present our work in five minutes. The speakers really impressed me by their interesting and helpful lectures and their friendly attitude.



*Diep giving his talk at the SEAYAC meeting*

In the last day of the meeting we went to West Java to visit the Bosscha Observatory, operated by the Bandung Institute of Technology. The construction began in 1923 and was completed in 1928, making it the oldest observatory in Indonesia. It is equipped with five optical telescopes, the largest one having a diameter of 71 cm. It is located on a hill, in the

middle of six hectares of land, 1'310 m above sea level. It is named after the owner of a tea plantation, Karel Albert Rudolf Bosscha, who donated six hectares of land for the new observatory.



*Phuong with one of the Bosscha Observatory telescopes*

It was great for me to see a real observatory with big telescopes and we had wonderful, romantic, unforgettable moments listening to *Für Elise* played by one of the participants on the piano in one of the meeting halls of the observatory. Our visit was warmly and kindly welcomed by the Observatory director, Dr. Mahasena Putra, and his staff. I was happy to learn that each day they welcome over five hundred visitors: it surely helps Indonesia having so many young students interested in astronomy.

After Bosscha we went back to Bandung and stopped at a floating market before joining a musical event in the Cultural Centre where we spent over an hour. We learned to play the angklung, a traditional Indonesian instrument in which each note is produced by two bamboo tubes tuned to the octaves and fixed on a common base. UNESCO designated the angklung a Masterpiece of Oral and Intangible Heritage of Humanity in 2010. Listening to and playing the angklung was an exciting experience. I also enjoyed visiting some places in Bandung, together with friends from Malaysia and the Philippines, such as the Institute of Technology, where I could see how the students live: how they study, how they do research, how they entertain themselves.

This meeting brought a lot to me, not only about astronomy but also about the experience of making friends from different countries. We will keep in contact in the future and tell each other about the progress of our research. Many are now among my Facebook friends. I am sincerely very grateful to the organizers for their support and for the excellent organization of the meeting. I am indebted to our SEAYAC colleagues for having so friendly shared so many things with me.



*Pedro Russo, Diep, Rogel (chair of SEAYAC) Mahasena Putra and a participant from Malaysia*

### **MY LAST STAY IN TOULOUSE**

*Tuan Anh reports on his third PhD stay in Toulouse.*

I spent my last four month stay in Toulouse focusing on the interpretation of the results from the analysis of the data collected on the gravitationally lensed quasar RXJ0911 and understanding how it fits into the general picture of high redshift galaxies. It turns out that our quasar lies at the low end of the observed range of gas masses of quasar host galaxies. It appears to be a scaled down version of the QSOs usually found at higher red shift: residing in a lighter halo, containing less gas, forming fewer stars and having a lighter central black hole.

Together with Frederic, I wrote a proposal to ask for ALMA time to observe another quasar having a similar redshift as our RXJ0911. Thanks to its special lens configuration, including three galaxies, and its source position very close to the lens caustic, we can resolve it up to 50 pc by observing the CO(9-8) molecular line. It is the

best gravitationally lensed quasar to be observed with ALMA in terms of high spatial resolution.

Apart from the work, I also enjoyed my last stay in Toulouse in spite of the rain that was heavier than in the preceding years. I spent more time than before in a bar downtown, probably because my very pleasant room was nearby. That is where I met Antonio, who had just arrived to the institute to work as IT technician for MUSE (Multi Unit Spectroscopic Explorer), a powerful instrument of ESO's Very Large Telescope. He is a very nice guy, who looks likely to move around a lot during his lifetime. He suggested me to read some Terry Pratchett's writings such as 'Color of magic', 'Going to postal' and so on and kept talking about them. We enjoyed meeting in this noisy place where, fortunately, communication is not a problem after a few glasses of beer. This is also where I had my farewell party, together with other members of the Institute.

I also spent a week in Paris with Hoai and Nhung at the end of November while Frederic was away in Chile. Thibaut kindly guided me through Observatoire de Paris. The weather was bad and did not invite walking across Paris but I learned about Beaujolais nouveau, the young wine of the year, of which Nguyen Quang Rieu offered us a bottle.

### **AUTUMN 2013 IN PARIS**

*D.T. Hoai and P.T. Nhung report about their stay at the Observatoire de Paris from September to December 2013*

We left for France after two busy weeks of school and conference in Quy Nhon. Each of us had been in Paris before, we were familiar with the place and feeling at home, but what was new was the two of us being there together. For Hoai, it was the second four-month stay for her PhD, in the framework of a cotutelle agreement between Ha Noi and the Observatoire de Paris, while Nhung went there with support from the French CNRS in the framework of a LIA agreement to join Thibaut's team and work with them.

We had just arrived in LERMA (Laboratoire d'Etude du Rayonnement et de la Matière en Astrophysique) when we got the visit of Bac Pierre and Nga who were on their way back to Ha Noi after having attended a conference



*Left to right: Nhung, Rieu, Hoai and Tuan Anh at Rieu's place*

in Erice and spent time with Pierre's brothers and children. We had lunch together and Thibaut took us on a tour around the observatory.

In Paris, we continued our work of modelling the CO emission from the circumstellar shell (CS) of an AGB star – meaning in the nearly last stage of its evolution – named RS Cnc. Comparisons with high-resolution CO(1-0) and (2-1) images, obtained at the IRAM Plateau-de-Bure interferometer and Pico Veleta 30-m dish, make it possible for us to characterize the stellar outflows close to the central star, where the wind is faster and denser along the polar directions than in the equatorial plane. We also started working on a simple model of HI emission, an excellent tracer in the external regions of the star where the interaction between expanding winds and the surrounding interstellar medium becomes dominant. While Nhung mostly worked on adapting the CO model to different measurements and to other stars, Hoai concentrated on finalizing her paper on RS Cnc and developing the HI model. Of course, we often shared ideas and exchanged pieces of work while, as usual, Thibaut was always ready to help us and discuss with us.

During our stay, Thibaut invited his collaborators to the observatory to work with us: Eric Gérard from Meudon, Lynn Mathews from Haystack and Jan Martin Winters from IRAM. We went over many topics: the preferred CO model, new CO and HI observations of RS Cnc, other interesting sources, and also probable proposals for new observations at Plateau-de-Bure and the Very Large Array.



*Hoai (in red) at IRAM school*

In September, Hoai attended the IRAM school in Pradollano, near Granada, Spain. While last year school in Grenoble was on interferometry, with particular attention to Plateau de Bure, this year was on single dish observation, with particular attention to the 30 m Pico Veleta telescope. There were about forty students from many countries. Apart from lectures, the students, divided in five groups, had an opportunity to spend four hours making observations using the 30 m telescope. They spent most of the afternoon time working in groups on the analysis of the data and the preparation of their presentation. Much time was available to talk and discuss with the lecturers and the other participants. The school excursion took us to the Alhambra and the Generalife garden, the beauty of which are amazing.

In October, an event drew particularly our attention: the Science Festival that was taking place everywhere in France. Since we had been told that Vietnam would have its Science Day for the first time in May 2014, we took advantage of the event to see what was being done. We visited several places: the Observatory, Université Paris Diderot, Collège de France, Jardin des Plantes and Université Pierre et Marie Curie, where Nhung enjoyed meeting her former PhD director, Pierre Billoir. We attended interesting activities and brought back with us a rich set of ideas and a collection of photos and videos.

At the beginning of December, together with Thibaut, we attended a workshop on astrospheres – meaning the environment at the boundary between a star and the interstellar



*On the roof of l'Observatoire. Left to right: Nhung, Pierre, Nga and Thibaut*

medium – in Leiden, Holland. It gathered more than thirty researchers from different astrophysical disciplines and communities, using different approaches, with the aim to put together a coherent picture of the physics of the interaction between expanding circumstellar winds and the surrounding interstellar medium. This was a good chance for newcomers like us to get acquainted with the field. We met again Lynn Mathews there and discussed with her about our article on RS Cnc. We also made contact with an expert in hydrodynamic simulation to prepare for our HI work. And, of course, we took the opportunity to visit Amsterdam and the old city of Leiden.



*Hoai, Michèle and Nhung at Chambord castle*

While in Paris, we had the pleasure to meet many of the VATLY friends: Pierre Encrenaz, Françoise Combes, Catherine Prigent and Alain Maestrini, who all work in the same

laboratory as Thibaut; Michèle Gerbaldi, Nguyen Quang Rieu and Jacques Haissinski, who visited us at the lab from time to time to talk and encourage us. Michèle took us to a wonderful tour around the beautiful region of the Loire castles. We were invited to Thibaut's, Rieu's and Alain's places, where we very much enjoyed delicious home cooked French, Vietnamese and, respectively, Italian meals. Just before going back to Vietnam, we had a visit from Jacques who, in spite of a very busy schedule, managed to find the time to say good bye and kindly offer us two astrophysics books that will help us with our work when back in Vietnam.

### **TWO WEEKS IN QUY NHON**

*Pierre reports about the astrophysics school and the international conference that took place in Quy Nhon on the occasion of the inauguration of the International Centre for Interdisciplinary Science and Education.*



*Tran Thanh Van and his wife Kim*

Last August, for a few days, Quy Nhon, a coastal Vietnamese town at about twice the distance from Ha Noi than from Sai Gon, has become a hot-spot of Science. With the inauguration ceremony of the International Centre for Interdisciplinary Science and Education (ICISE), August 12<sup>th</sup> was the culmination of many years of tireless effort dedicated by Tran Thanh Van and his wife Kim to the establishment and construction of the Centre. Seeing such effort rewarded in spite of the many obstacles that need to be overcome in this kind of endeavour is by

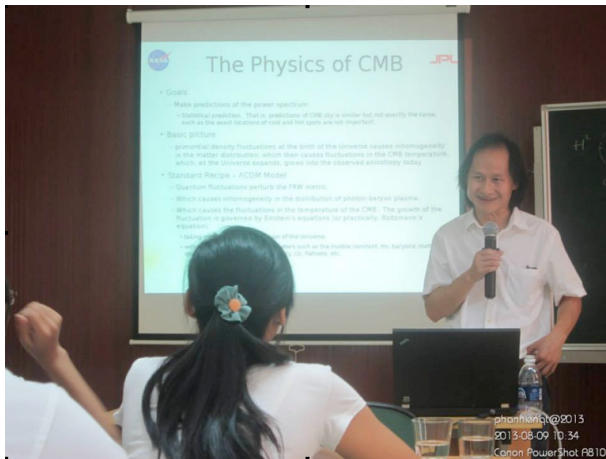
itself extremely gratifying and our debt and gratitude to Van and Kim for all what they are doing for Science and for Vietnam are immense.

Five Nobel and one Fields Medal laureates, together with a Deputy Prime Minister and a Minister, not to mention the CERN Director General, the APS Chair, and many other prestigious bigwigs, honored the ceremony with their presence; even the Emperor of Jade ordered a huge downpour to mark the solemnity of the event. Today ICISE, under the umbrella of Rencontres du Vietnam, offers excellent infrastructure for conferences and schools and aims at playing in the region a role similar to that played by Erice in Europe. It is splendidly located near a sandy beach, far enough from town to ensure the calm needed for reflection and fruitful work.

Bracketing the inauguration ceremony, two events, both of excellent quality, have drawn several of us to the place: the week before was dedicated to a school that the whole team attended and the week after to a conference on major highlights of Particle Physics and Astrophysics, entitled *Windows on the Universe*.

The school, *Vietnam School of Astrophysics* (VSOA), covered most hot topics of modern astrophysics with lectures by Roland Triay and Nguyen Trong Hien on Cosmology, by Phan Bao Ngoc on Brown Dwarfs and by Dinh Van Trung and Nguyen Luong Quang on molecular astrophysics. Pierre Lesaffre gave introductory lectures on galaxies, stars and planets and Diep on cosmic rays. Seminars were presented by Nhung on solar oscillations, by Hoai on an AGB star in its thermally pulsing phase, by Dong on our radio telescope and what it has achieved, by Tuan Anh on the host galaxy of a gravitationally lensed quasar. Phan Bao Ngoc chaired the local organizing committee of which Diep was a member and Pierre Lesaffre served in the Scientific Committee. The school was rated as a real success by all participants, who included undergraduate and master students from USTH, HCMC International University, Quy Nhon University and HCMC University of Education. Each evening made room for an hour of relaxed discussion on the beach, which was an opportunity to get to know one another better and to share experiences. With some IAU support,

Quang organised a meeting collecting high school and university students from several places in Central and South Viet Nam, named *Quy Nhon meets Moon and stars*. Diep, Pierre Lesaffre and Nguyen Trong Hien gave presentations to the meeting which closed with a star watching evening. While the cloudy sky prevented any real observation, it was a nice opportunity to discuss with a young and enthusiastic audience, which a general public had joined, and to initiate them to telescope observations.



*Nguyen Trong Hien lecturing on Observational Cosmology at VSOA*

The Conference covered all hot topics of modern Particle Physics and Astrophysics with up-to-date reports on the Higgs discovery and its implications. The plenary talks, of an outstanding quality, are available on the web site of the Conference. Nhung presented our observation of solar oscillations, now understood as instrumental but at that time still a puzzle, and Diep talked about research in VATLY in parallel sessions. The Conference was for us an opportunity to meet several old friends. Particularly moving was the time spent with Jack Steinberger and Jacques Haissinski, both very good friends of VATLY who follow our work with attention and interest and encourage our progress across our failures as well as our successes. We took time to share a quiet dinner with them in town and tell them about the difficulties we meet in promoting fundamental research in the country and the pleasure we have when we see some progress. Pierre particularly enjoyed meeting Charling Tao, who is now sharing her time between France and China, and

who introduced us to Di Li, a Chinese radio astronomer who returned to China after a long stay in the States and is now having leading responsibilities in the FAST project, a scaled up version of the Arecibo telescope (500 m diameter instead of 300).



*Nobel Laureates in the front row: from left to right, Jack Steinberger, Shelly Glashow, Klaus von Kitzling, David Gross and George Smoot*

On the last day of the Conference Van introduced a "*General discussion about the future of ICISE and Regional collaboration*" and raised a number of questions that could not receive immediate answers but should draw the attention of the science community in Vietnam.

The inauguration of the Centre, with the presence of Nobel laureates and high level Government representatives, has set Quy Nhon in the limelight for a few days. Obviously, it is not enough to make it a success. It requires instead lasting actions and bottom-up rather than top-down initiatives. Lacking these, the Centre would at best become a kind of resort for meetings of various kinds. This is not what we want; we want it to be useful for Vietnam and for its science. We should not expect the Minister, or whoever having high level responsibilities, to do the job for us. Enough of top-down preparation has been done, the ball is now in our camp: it is up to us to get together to propose and organize schools and workshops gathering communities of the right size, not too small but not too large. One might argue that such events exist already, in places like Do Son, for example. But the advantage and specificity of Quy Nhon is to be sufficiently far

from Ha Noi and Ho Chi Minh City to bring together northern and southern teams and, most importantly, to impose on lecturers to be present during the whole duration of the school and be hosted in the same premises as their students. The costs of transportation and of living expenses are low enough not to be an obstacle difficult to overcome.



*Kim and Jack*

I am personally convinced that such initiatives would be very beneficial to Vietnamese science. It would be an excellent opportunity to mix students from different universities and institutes, from the North, from the Centre and from the South, to give them a chance to get to know each other, to create links, to foster the seeds of possible future collaborations. One should favour lecturers from the younger generation; we need such opportunities to give them a chance to blossom. Some lecturers should of course be invited from abroad, chosen among those who care most about the development of high quality science in Vietnam, and among the young generation of Viet Kieus who are most successful in their domain. But as many as possible should be chosen among competent Vietnamese scientists from the young generation. Such schools should also be used to foster contacts and establish networks of competence among young scientists in the region, including both ASEAN countries and, most importantly, China, South Korea and Japan, three countries that are now giving important contributions to the forefront of modern science, China being the most

recent but also that of which the domain of influence expands fastest.

Indeed, the conference has been a good illustration of the usefulness of bringing together the young scientific community in an environment where they get to know each other better. Its main benefit to Vietnamese science has been the opportunity for young Vietnamese scientists to share a lunch with prestigious scientists, or a walk around a Cham tower, and to demystify this way the paralysing aura that they were attaching to their names; it has been the evenings spent on the beach around a bottle of local *ruou*, discussing with famous Vietnamese scientists from abroad, such as Ngo Bao Chau, Nguyen Trong Hien and Dam Thanh Son, who care about helping Viet Nam's science to progress and are curious to understand the environment in which we live in order to be better prepared to help us; it has been lunches bringing together young astrophysicists from Ha Noi and Saigon to discuss with their young Chinese colleagues possible future collaborations; it has been the presentations given in parallel sessions of the science that we are doing, making our colleagues from abroad better aware of the effort that we are devoting to the development of fundamental research in the country.

### ***PROMOTING ASTRONOMY IN SOUTHEAST ASIA***

*In the past two years Diep attended several meetings for the promotion of astronomy education and research in Southeast Asia and addresses the issue.*

While astronomy keeps developing in South-East Asia (SEA), it is still in an embryonic state. As clearly analysed by Prof. Boonrucksar Soonthornthum (NARIT- National Astronomical Research Institute of Thailand) in his talk at the IAU XXVI<sup>th</sup> General Assembly in Prague (August 2006), the causes are many: 1) Lack of national policy on long-term investment in the field; 2) Lack of planning, management, and support of activities from the governments, an obvious consequence of 1; 3) Lack of concrete strategies and directions for research aimed at keeping at home high-level astronomers and at motivating researchers; 4) Lack of vision to encourage collaborations with well-established astronomical

teams in other countries; 5) Lack of infrastructure comparable with international standard; 6) Inability to reach critical size in both human resources and investments; 7) Insufficient access to relevant information through journals, textbooks, Internet and other electronic means. This eight year old analysis is still pertinent today and no in-depth breakthrough has really taken place.

The scientific development of a country depends on its culture, economics and politics. It reflects the interest of the country in the field. The numbers of IAU members in the ten SEA countries are: Brunei (0), Cambodia (0), Laos (0), Myanmar (0), Singapore (2), Philippines (6), Malaysia (7), Vietnam (9), Indonesia (16) and Thailand (20). These numbers reveal that the first five countries are still far from getting involved while others, from the Philippines to Thailand, show a growing interest.



*Wayne Orchiston (NARIT) and Diep at the Chiang Mai school*

In 2007, in order to progress, NARIT initiated an official collaboration in astronomy research with the South-East Asia Astronomy Network (SEAAN). Its aim is to strengthen research and education activities in SEA. The first SEAAN meeting was held in Thailand in March 2007, hosted by NARIT and the Thai Ministry of Science and Technology. Four science working groups were established: radio astronomy, optical astronomy, theoretical astrophysics and cosmology, cosmic rays and solar physics. Since then four additional SEAAN meetings have taken place: in the Philippines in 2010, in Thailand in

2011, in Indonesia in 2012, in Malaysia in 2013 and the next one will be held in the Philippines again, in October 2014. In addition to providing a forum for scientific presentations, the meetings reviewed the progress of the network and future plans, including financial and other matters. Starting with five members at the beginning, SEAAN now covers all SEA nations except Brunei. Several memorandums of understanding have been signed at ministry level for research collaboration under the framework of SEAAN between Thai, Indonesian, Malaysian and Filipino institutes. International schools and exchange programmes for students and experts have been organized.



*Diep at the COSPAR conference in Bangkok*

Besides SEAAN, SEAYAC (South-East Asia Young Astronomers Collaboration) is another good symbol of collaboration in the region. It was created at Gunma Astronomical Observatory, Japan, in December 2008 by six students from Indonesia, Malaysia, Philippines and Thailand. The main SEAYAC objective is to foster interaction and collaborations between young astronomers from all SEA nations, not just in astronomy, but also at the social, cultural and even personal levels, in order to attract the young generation to astronomy. Furthermore, it aims at promoting interactions between young astronomers in SEA and abroad through exchange programmes and similar activities. By hosting regular meetings/conferences and other events, young astronomers from each SEA country should gain exposure in attending and experience in organizing international conferences, an excellent

investment for the future. Phuong and I attended the last SEAYAC meeting in Bandung, which attracted more than 50 participants and is reported elsewhere in the Newsletter. It was a successful meeting that generated mutual understanding and friendly links while inspiring young students and strengthening collaboration between them.

For historical reasons, optical astronomy is given more attention than other wavelengths in SEA. Recently, Indonesia, Malaysia, Thailand and Vietnam started to be active in radio astronomical research and instrumentation. Therefore, NARIT in cooperation with KASI (Korean Astronomy and Space Institute) organized a school in Chiang Mai on radio astronomy with the aim to make SEA students aware of recent radio astronomy developments in these countries and to introduce them to the basics of radio astronomy. Several of us attended and Thao reports about it elsewhere in the Newsletter. As one of the efforts to strengthen collaboration in the region, the idea of a regional very long baseline interferometer network has been discussed.

The fact that SEA countries enjoy a free visa policy eases collaboration between them. In addition many SEA countries are in a similar state of development and understand well each other living and research conditions.

For more than two years since we joined SEAN and SEAYAC, after having attended the SEAYAC meetings in Bandung and the NARIT-KASI School in Chiang Mai, where I was invited to report about astronomy and astrophysics in Vietnam, I learned a lot about the development in SEA of astronomy in general and radio astronomy in particular. I have clearer views on possible future collaborations with our neighbours and feel confident in a bright future for SEA with many enthusiastic young students and researchers in the field.

### **NATIONAL NUCLEAR CONFERENCE IN VUNG TAU**

*Dong and Thao attended a national conference on nuclear matters in August last year; Dong reports about the issues that have been discussed.*

In the middle of August 2013, the 10<sup>th</sup> National Nuclear Science and Technology Conference was held in Vung Tau city with the participation of

more than 300 scientists, researchers, PhD and graduate students from over 40 institutions of science, technology, education and training in Vietnam and abroad. It was dedicated to nuclear science and technology, reflecting the important role that nuclear power will soon play in Vietnam and the development of radiation related applications in the economic and social sectors. Two nuclear power plants are in the pipeline, one with the partnership of the Russian Federation and the other with that of Japan. Le Dinh Tien, Deputy Minister of Science and Technology, attended the conference and gave the opening address.



*Dong giving his talk in Vung Tau*

The conference included 270 reports from many areas related to nuclear science and technology that had been grouped in seven sections. The speakers stressed the importance of nuclear power for the nation and reported on the progress with the Ninh Thuan plant, underlining the need for a new approach with a long term vision. They also noted the increased role played by nuclear applications in many sectors, demonstrating their importance for the country's economy. Dr Tran Chi Thanh, Director of VINATOM, identified in a plenary session report a number of issues to be addressed in order to promote R&D in nuclear engineering and stressed the need for a plan aimed at training experts in nuclear science and engineering, implying sending trainees abroad. Training, he said, is the urgent and top priority task for the five to seven years to come.

After the astrophysics school in Quy Nhon, two of us, Thao and I, attended the

conference in Vung Tau. We joined section B, namely *Nuclear physics, nuclear data and accelerators*. Thao reported on the VATLY Cherenkov detector and its response to electrons and muons, the central topic of her PhD thesis, with emphasis on the response to low signals. Muon decays in the water volume are clearly identified and modelled using simple simulations of the physics and of the instrument. I reported on VATLY's training facilities, in particular, the availability of a stack of six large scintillator plates used to detect cosmic muons. I described the set up and its performance as a training tool. In section B, in addition to INST, most reports were from the Institute of Physics, the Da Lat Nuclear Research Institute and the University of Sciences in Ho Chi Minh City. The achievements of VATLY over the past twelve years, both in terms of research and of training, were highly appreciated. During this time, 5 PhD, 9 Master and 13 Bachelor students have been trained in VATLY, giving them an opportunity to become familiar with the methods and techniques used in nuclear and particle physics experimentation, using scintillators, photomultipliers, decision and data collection electronics, data taking and online monitoring, as well as offline data analysis using standard data handing tools. Other equipment provides training in the domains of microwaves and radio astronomy, including our radio telescope. The equipment of our laboratory was seen as suitable for contributing to the training of the VINATOM staff and what we have achieved was praised as setting a good example for others to follow.

### **THE COURAGE OF FACING THE TRUTH**

*Nhìn thẳng vào sự thật, đánh giá đúng sự thật, nói rõ sự thật*  
*Face the truth, recognise the truth, tell the truth.*  
VIth Party Congress, 1986

I just finished reading Nguyen Thi Binh's autobiography (Family, Friends and Country). She has a chapter on her ten years as Minister of Education. Reading it is enlightening. What she talks about happened less than thirty years ago, meaning yesterday for someone of my age. Her problems were: to unify education between North and South; to eradicate illiteracy among workers; to build new schools – including in remote parts

of the country – and pedagogical schools to train teachers; to simply survive the most difficult years of 1979 and 1980; to plant Hai Duong litchis to help improving teachers' wages; to guide actions such as "Green covers for bare hills", "Contribute bits of paper", "Collect bottles and cans" or "Gather duck feathers". Reading Binh's book makes it clear that the modern times Vietnamese University had to be built from scratch at the end of the eighties. We need to face the truth: in many domains, such as particle physics and astrophysics, to quote just two with which I am particularly familiar, it still needs to be built from scratch.

It is customary, for those of us who are familiar with western academic life, to praise virtues in which we believe as a gospel, such as intellectual and moral rigour or academic freedom; we fight arguments of authority and we encourage critical thinking; we praise the synergy between fundamental and applied research, between theory and experiment or observation, between research and teaching; we like to see the words that Hồ Dac Di pronounced in the Việt Bac forest between 1947 and 1949 be the basis on which the modern Vietnamese university must be built<sup>1</sup>. Many of us have dedicated their whole

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<sup>1</sup> To quote just a few: – *The more a teacher is gone beyond by his students, the more praise he deserves.* – *Higher education and research are twin brothers; the chair is but the anteroom of the laboratory.* – *University is not only the place where science is being taught, but also the place where it comes into being.* – *Research is a team work; it requires hard work and patient strain; it implies skills specific to the youth, being constantly on the look-out for a discovery in order to be able to catch the opportunity; good luck and attention go in hand with work, imagination and method.* – *Scientists must possess a broad cultural background in order to be more than skilful craftsmen trained in professional schools; their training must imply the development of all their intellectual and moral faculties, including sciences as well as arts.* – *Academic spirit is a specificity of higher education training [...]; it is complicity between student and teacher that leaves no room for abusing one's authority; only then, through a relation without restraint, can critical faculty bloom in complete freedom – the most beautiful flower of the human mind, so crucial to science.* – *We must doubt when we study and have faith when we act.* – *One can*

lives to such ideal. The danger, however, is that such a gospel becomes a cocoon of intellectual comfort that prevents us from looking straight at the truth. The truth is that the words of Hô Dac Di were incredibly ahead of his time and are still far from being meaningful to the average Vietnamese scholar.

It is customary to allude to the Confucian influence on the Vietnamese culture when disserting about higher education in Viet Nam, to remark that Van Mieu was built a few years before the oldest European university, that throughout history Vietnamese have always attached a paramount importance to education. The truth is that less than a century ago more than 90% of the nation was analphabetic, that thirty years of wars have deprived a whole generation of education and training. Today, the situation is reversed, more than 90% can read and write; parents and grand parents see universities as the gateway for their children to wealth, to social promotion, to happiness; in a word to all what they have been hoping for during their difficult lives and did not have a chance to enjoy. They make enormous sacrifices to support their children through their university years; those who are better off save for years in order to send their children study abroad. But the truth is that they identify in their mind happiness with fortune, culture with wealth; the truth is that their children grow up with the idea that money is more worthy of respect than knowledge. Seduced by the magic of words, universities train their students in economy, management, marketing; but the truth is that they mostly train bank clerks, pen pushers, foremen and commercial travellers. In the Ha Noi universities where I have taught, I have seen so many students waste four years doing nothing but forgetting what they had learned in high school. The truth is that universities deliver the bachelor degree without any serious control of what the

students have learned, that they give marks that are notoriously overvalued, that they show no rigour in their assessment of the students' skills and talents. I have seen so many students leaving Viet Nam to study abroad after graduation, with the idea that once they are outside the country science miraculously rains from the sky and pervades their brains without them having to do the least effort. And I have seen so many of them disillusioned after having had to face reality; those who were successful either decided to stay abroad, or, when back home, were offered no opportunity to achieve a return on what they had invested as new skills, new talents and new knowledge. The truth is that the country is suffering a disastrous brain drain, that much of what is invested by families and by the State to train their children abroad is simply wasted by our inability to take advantage of it. The truth is that the most educated part of the population are so convinced of the low level of our universities and have so little confidence in their competence that they do their utmost to send their own children study abroad.

Among so many blatant examples, a typical illustration of our inability to organise ourselves to achieve a return on the investment of sending students study abroad concerns nuclear power. For over a decade, the country has been discussing seriously joining the nuclear club in order to comply with the ever growing energy demand of the population. For over a decade, we have been unable to create a centre in which to train the future scientists and engineers who could operate the future plant; a centre that would serve as a basis from which to send staff abroad to study for short periods and welcome them back to teach their fellow students and transfer to them the knowledge that they have acquired abroad; a centre in which to invite foreign experts for short periods to give lectures on specific topics; a centre that would make good use of the experience accumulated over the years with the research reactor that is operated in Da Lat. Instead, we have been sending students abroad without monitoring their progress and without preparing their return home; some students went to study abroad on their own initiative but when coming back were not offered any position in which they could have taken profit of what they had learned. As a result, we are still completely unprepared and

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*bureaucratize scientists... but not Science. – What a good fortune it is for the scientist to have a job that mixes Science and Conscience; it is not enough to have a well filled brain; he must also have a blameless morality. – To all those who are fighting for freedom, University takes pride in swearing solemnly to see to the integrity of their intellectual legacy.*

some Vietnamese among the most competent in the field take argument of this failure to argue that Vietnam should give up his ambition to use nuclear power in a near future. Such is the truth.

A few years ago, a funding agency, NAFOSTED, has been created to allocate funds to scientific research, a praiseworthy initiative allowing for a more objective assessment of the respective merits of the proposed projects; the truth is that the allocations that are due to new projects since January 1<sup>st</sup> 2013 have not yet been awarded, more than a year later, and are kept blocked by the Ministry of Finances, causing major disarray and helplessness to the Minister of Sciences. Such is the truth.

One would think that in such a difficult context the scientific community close ranks and stick up for each other, encouraging teamwork, solidarity and collaboration between individuals. But such is not the truth, not at all. The truth is that each of the two or three particle physicists who are active in the country contribute to different experiments, precluding any hope to build some serious Vietnamese effort in the field. The truth is that learned societies are not enough active in promoting science and research and in helping the young generation to progress. Many do not even maintain a web site and make no serious effort to improve the quality of their publications. The truth is that NAFOSTED, the funding agency, makes no effort to encourage teamwork and federate individual initiatives. On the contrary, they require each proposal to spell out the details of the contribution of each individual in a given project rather than leaving such responsibility to the principal investigator.

We often hear complaints that the lack of adequate scientific instruments prevents Vietnamese research to progress. The truth is that I know of major instruments that had been given as gifts to Viet Nam by the Russians and stopped being operated after their departure by lack of competence available in the country. The truth is that a radio interferometer that had been given as a gift to Viet Nam by a Viet Kieu has been buried in a cupboard of a Ha Noi university for over 15 years; we unearthed it and a student of mine made his master thesis using it; a pen pusher of the university then realised that the item was missing on his inventory list and urged us to give it back;

it has returned to its cupboard where it is likely to stay for ever. The truth is that a Nuclear Physics Department has spent a few million dollars to buy an accelerator which they do not know what to do with; indeed, such an accelerator would have brought good times to nuclear physicists some sixty years ago but, today, is used mostly by material scientists; however, the acquisition was made without consultation of the material science community, who were unaware of it and are not given a chance to exploit it now that it exists. The truth is that I have seen individuals plead for the acquisition of major expensive equipment, at the hundred million dollar scale or more, without even consulting their colleagues and without paying attention to the fact that nobody in the country has the skills and experience necessary for their proper use, operation and maintenance. The truth is that I know of modern machine tools, lathe and milling machine, that have been given to Viet Nam as gifts and have been sleeping in a garage for over a decade with no one using them by lack of competent operator.

Having a university degree should be recognised as a sign of competence and skill and should promote the young graduate among the elite on which the nation counts to build its future. The truth is that it has no value at all, that the best way to get a good job is to give a well filled envelope under the table to your future boss; unfortunately, I have seen many such cases, including high school teachers and policemen. The truth is that having an uncle with a high rank in the Party is your best chance to get a good job. The truth is that the wages of a civil servant are too low for him to feed his family, that he must take a second job or do something similar to survive. The truth is that there is no difference of salary between who works hard and who does not even come to the office, except on occasions such as Tet to fetch his envelope. The truth is that the Vietnamese society has no respect for whom earns little money, and therefore no respect for teachers and scholars.

A few years ago, the Prime Minister declared his intention to see 20'000 PhDs having graduated by 2020. The truth is that three of my former students, who made their PhD under joint supervision between Viet Nam and prestigious French universities, have not yet received their

Vietnamese degree, after several years, in spite of the existence of a signed agreement between Viet Nam and France stating explicitly that after the defence of the thesis, the doctor degree should be awarded by both universities. The truth is that a student of mine, who is making her PhD under the Vietnamese system, has completed the writing of her thesis several months ago but has now to run through an incredible marathon of administrative quibbling and hair splitting: eight different oral presentations, a review by two referees – one of whom made comments revealing his/her lack of familiarity with the field – the requirement to collect fifteen positive assessments from fifty Vietnamese doctors to whom a short version of the thesis has been sent – and most of whom do not really understand what the thesis is about. Currently, PhD students must give a report every three months to the administration of the doctoral school on the progress of their work, as if the thesis supervisor were incompetent, unable, irresponsible, or crooked, and could not be trusted to do his job properly. One could think that such a Big Brother behaviour would prevent fraud in the award of doctor degrees, but the truth is that we regularly hear of cases of students buying their degree for high amounts of money or having their thesis written, or better cut-and-pasted, by specialists who earn their living this way.

Pedantic names are used to impress people. When walking through the corridors of Vietnamese institutes or universities, you see many doors labelled Giám Đốc of this or Giám Đốc of that, but the truth is that the staff of the department of which this person is director consists often of a single person, himself, and the office is empty most of the time. I had students making their graduation dissertation with us from a supposedly prestigious class of a Ha Noi university named *High Energy Physics and Cosmology*. The truth was that these students not only had no idea of what relativity and cosmology may mean, but they even were lacking the most rudimentary bases of elementary physics.

A few years ago, a case of plagiarism was revealed; a group of physicists, including two professors, one of them of high rank (representing Viet Nam in an international instance) had concocted an article cut-and-pasted from published material, to which they had added a few

meaningless sentences, and had submitted it for publication to various journals of international audience. Some accepted it – it says a lot about their referee system – but a few noticed the fraud. The truth is that no action was taken to prevent such a bad event to repeat.

We must have the courage to face the truth. The point is not to blame anyone; there are many historical reasons why we are in such a situation. The point is not to make anyone feel guilty. The only one to be blamed is who refuses to face the truth. The truth is that we have to build the Vietnamese university of the future from scratch, that the kind of papering over the cracks that we have been using in the past decades leads nowhere. The truth is that it takes generations to achieve such a goal. Two thirds of the Vietnamese were born after Doi Moi. We need to rethink which kind of education and training we need, and can afford, to offer them. We must stop comparing Vietnamese universities with universities abroad, this is not only meaningless but, worse, misleading. We must set priorities, revise our views concerning the share between apprenticeship, professional schools, business schools and universities proper. We must have better ideas of how many medical doctors, engineers, teachers, architects, etc. the nation needs. And in particular more realistic ideas about how many economists, managers and businessmen. Better ideas about the share between the civil servant and private sectors. We no longer are in the eighties, when the problem was to collect bottles and cans and gather duck feathers, but we are not either at a stage where it makes sense to talk about Shanghai ranking and other utopias. The tasks that Nguyen Thi Binh undertook thirty years ago are not yet completed; they must be addressed in priority. Comparing Vietnamese universities with Cambridge, Harvard or Oxford is nothing but a bad joke.

Such are the priorities, together with restoring morality and integrity in our practices. Education cannot lead anywhere when the best way to get a good job is to have money, or good connections, or an influent member in one's family. Corruption is the worst enemy of education.

In such a landscape, what about the university that Ho Duc Di was preaching for? Of

course, we cannot dream of seeing it soon become a reality at the scale of the nation. Building it from scratch takes generations, not simply a few years. No one has the magic wand that could make such a miracle possible. Having the courage of facing the truth is also being able to assess what we are able to achieve and to adjust our ambitions to it.

Yet, I should like to argue that we can afford to make room for sowing the seeds of some fundamental research at the frontier of current knowledge. It can only be made on a modest scale, excellence must take precedence over quantity. What does it imply?

First a selection of a few fields that the country is prepared to – and can afford to – support. Such a selection must take proper account of the promises of the particular field one wishes to develop: some fields have more unanswered questions than others, with good hope to see them answered in the coming few decades, and are closer than others to the frontiers of knowledge. It must take proper account of the financial support that is implied; money should not be wasted in constructing at home equipment that exists abroad and can be used by us at low expense; the money invested at home in new scientific equipment should be very critically discussed within broad circles including foreign expertise. It must take proper account of which talents and skills there are in the country; a field should be supported only under the condition that there exists at home a dynamic team having shown their ability at developing efficiently the particular field of research in which they are active. It should take proper account of the relation of the field to be supported with applied

research and applications, even if this should not be a priority.

Another implication is the need to recognise merit. Here also, we must have the courage to face reality. The truth is that many university teachers simply read their lectures in text books and are unable to conduct any research work. We must deliver habilitation degrees to those who are able to construct and write their own lectures and to conduct research and we must give them decent wages. Wages that allow them to devote all their time and effort to teaching and research, wages that give them the dignity that they deserve. Today, a young researcher earns much less than a pen pusher working in a bank or in some joint venture company; he lacks consideration from his friends or family who have no respect for what he is doing but see only the low level of his remuneration; in order to survive, he must take a second job or teach twice as many hours than would be reasonable. Such is the truth. On such a basis we shall never be able to build the university that we need.

What is urgent is to equip the youth with what is needed to have the courage to face reality, to look straight at the truth, to think critically and act accordingly. The priority is to train responsible adults. This does not exclude making modest room for supporting some fundamental research as long as it aims at excellence and can serve as a basis on which to build the university of tomorrow that Ho Dac Di was dreaming of in the late forties. But before investing in equipment, we must invest in people, we must invest in brains, we must build the teams who will be able to use, operate and maintain such equipment.

*Pierre Darriulat*

**Distribution:** Elie Aslanides, Patrick Aurenche, Jim Beatty, Cristoforo Benvenuti, Jean Pierre Bibring, Pierre Billoir, Frederic Boone, Bui Duy Cam, Ludwik Celnikier, Ngo Bao Chau, Nguyen Duc Chien, Nguyen Mau Chung, Françoise Combes, Alain Cordier, Jim W. Cronin, Nguyen Nhu Dat, Manoel Dialinas, Luigi Di Lella, Giap Van Duong, John Ellis, Pierre Encrenaz, Alberto Etchegoyen, Roger Eychenne, Jerome Friedmann, Daniel Froidevaux, Yoshitaka Fujita, Jose Gabriel Funes, Michèle Gerbaldi, Nguyen Van Giai, Yannick Giraud-Héraud, Sheldon Lee Glashow, Kevin Govender, Stéphane Guilloteau, Edward Guinan, Jacques Haïssinski, Chu Hao, John Hearnshaw, Pham Duy Hien, Nguyen Van Hieu, Emmanuel Hinglais, Pham Quoc Hung, Nguyen Dai Hung, Fadi Ibrahim, Antonio Insolia, Stavros Katsanevas, Dao Tien Khoa, Marc Lachièze-Rey, Nguyen Quynh Lan, Pham Tran Le, Thibaut Le Bertre, Pierre Lesaffre, Di Li, Nguyen Van Lien, Alain Maestrini, Grant Mathews, Jean-Christophe Mauduit, Peter Mazur, Young Chol Minh, Phan Bao Ngoc, Wayne Orchiston, Etienne Parizot, Denis Perret-Gallix, Minh Ha Pham-Delègue, Tran Viet Phuong, Philippe Quentin, Burton Richter, Nguyen Quang Rieu, Jean-Michel Rieubland, Carlo Rubbia, Pierre Sebban, Sally Seidel, Rogel Mari Sese, Greg Snow, Paul Sommers, Phan Hong Son, Michel Spiro, Jack Steinberger, Tiina Suomijarvi, Christine Sutton, Annick Suzor-Weiner, Tran Minh Tam, Charling Tao, Dick Taylor, Tran Chi Thanh, Samuel C.C. Ting, Tran The Trung, Dinh Van Trung, Hiroshi Tsunemi, Nguyen Van Tuan, Pham Anh Tuan, Hoang Tuy, Marcel Urban, Odon Vallet, Jean Tran Thanh Van, Suzy Vascotto, Sylvie Vauclair, Tini Veltman, Nguyen Ai Viet, Alan Watson, Joël Weisberg, Atsushi Yoshida, Antonino Zichichi.

**Contact:** [vatlyhanoi@yahoo.com.vn](mailto:vatlyhanoi@yahoo.com.vn)

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<http://www.inst.gov.vn/Vatly/Vatly.htm>

–PHOTO ALBUM–



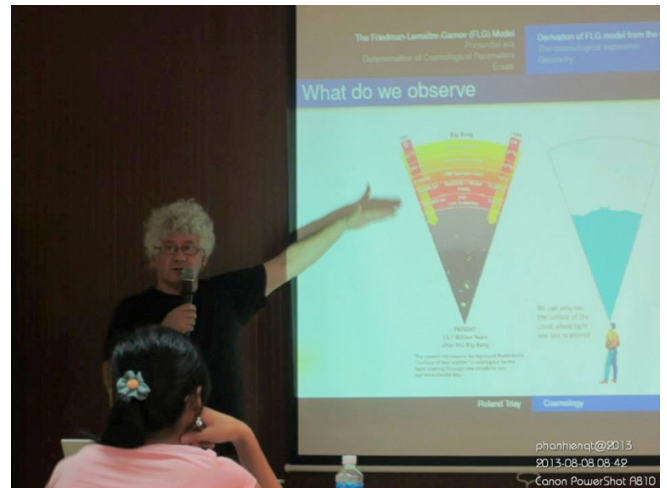
*ICISE inauguration ceremony. Alternating with beautiful but anonymous young ladies, we see from left to right: Nguyen Van Hieu (former VAST Director), George Smoot, the Party's General Secretary of Binh Dinh Province, Minister Quan (of Science and Technology), Deputy Prime Minister Nguyen Thien Nhan, Tran Thanh Van, the President of Binh Dinh People's Committee, Ngo Bao Chau and the architect.*



*The Vietnam School of Astrophysics. We leave it to the reader to identify (from left to right) Tuan Anh, Nhung, Phan Bao Ngoc, Tran Thanh Van, Pierre Lesaffre and Diep (or rather  $\frac{3}{4}$  of each) and Hoai. The picture was taken at the end of the school and Dong and Thao were preparing to leave for Vung Tau.*



*Phan Bao Ngoc lecturing at VSOA*



*Roland Triay lecturing at VSOA*



*Les trois Pierre, Darriulat, Encrenaz and Lesaffre*



*The VATLY team having dinner with Jack Steinberger and Jacques Haïssinski*



*The VATLY team and Pierre Lesaffre celebrating Pierre's birthday*



*Thao, Diep and Phuong in an orchid garden in Chiang Mai*



*Left to right: a Japanese colleague, Hoai, Nhung, Diep and Di Li in Quy Nhon (with ICISE in the background)*



*Shelly and Diep visiting the one pillar pagoda in Ha Noi*



*Nhung, Rieu, Hoai and Thibaut at Rieu's place*



*Tuan Anh and his former university classmate visit Notre Dame*



*Floating crown (krathong) on the occasion of the 2013 Thai Loi krathong festival*



*Left to right: Nhung, Rieu's wife, Rieu and Hoai*



*Dong and Diep riding an elephant in Patara Elephant Farm in Chiang Mai*



*Thao's scarf, Diep, Dong and Phuong floating along the river on a bamboo raft*



*The VATLY group before departing to Ha Long to attend Alain Maestrini and Huyen's wedding*



*At Alain's wedding with Pierre Lesaffre's four daughters and his mother (left row)*



*Singers Dao Mac and Trang with Pierre after the performance*



*Alain and Huyen with their niece and nephew*