

## VATLY NEWSLETTER

*“As long as we shall pay no attention to the living conditions and wages of the actors of science and as long as we shall prove unable to change our old methods of management, we shall fail to let science and technology take off.”*

*Minister of Science and Technology Nguyen Quan*

*“A nation that wants to be strong, to decide of its own destiny, and to establish itself on the international scene cannot afford to neglect fundamental science.”*

*Prof. Dr. Nguyen Huu Viet Hung*

### CONTENT

This twentieth issue of the **VATLY NEWSLETTER** opens with the traditional **NEWS FROM THE LABORATORY** and goes on with a report that was written during the April Workshop and endorsed by the participants, **THE RISE OF VIETNAMESE ASTROPHYSICS**. Diep reports about the **FAST RADIO TELESCOPE** that is under current construction in nearby China, Pierre about the celebration of the **30<sup>th</sup> ANNIVERSARY OF THE DA LAT REACTOR**, Nhung about the **SCIENCE DAY AND RELATED EVENTS**, Thao about **A VISIT OF DANG VAN VIÊT**. The issue closes with a **LETTER TO THE PIERRE AUGER COLLABORATION** that was sent to its spokesman in expression of our gratitude and a **MISSING INTERVIEW**, 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.*

A highlight of the period covered by the present issue is the workshop that we organised in April at the Institute and that brought together the whole (but minuscule) Vietnamese astrophysics community and four foreign guests for whom we had obtained IAU support. In addition to us, whom Dao Tien Khoa had joined, the former included Dinh Van Trung and Phan Bao Ngoc as well as members of the universities of education in Ha Noi (Nguyen Quynh Lan) and Ho Chi Minh City (Cao Anh Tuan). A report by Pham Anh Tuan, in charge of the Vietnamese Space programme, triggered hopes for increased support which we took seriously even if there is still a long way to go before such dreams become

reality. In the wake of this presentation, we are currently considering the possibility to move from the institute that hosts us today to the Vietnam National Satellite Centre where we would become their science department. Participants from abroad included, in addition to Thibaut Le Bertre, astronomers from China (Di Li), Korea (Young Chol Minh) and Japan (Kazuhiro Sekiguchi). All were extremely friendly, eager to learn about the situation in Vietnam and ready to help us grow as much as they can. Concretely, in addition to a continued and happy collaboration with Thibaut le Bertre, we showed interest in the possibility of collaborating with Di Li on the Arecibo-type radio telescope that is in current construction in nearby China, a 500 m diameter antenna, about which Diep reports farther down in this issue. A report on the workshop, written for publication in Tia Sang, is copied below. It is now up to us to make good use of the boost of the workshop by having closer contacts between us, obtaining a proper participation of Vietnam to IAU, taking advantage of the recent election of Dinh Van Trung as chair of the astronomy society to make it become helpful and useful to the cause of astronomy and astrophysics in Vietnam, obtain increased support aiming at building the skills and know how toward the establishment of a future National Observatory.

After the workshop, Diep, Nhung and Tuan Anh took Di Li to Ninh Binh for a tour among the beautiful landscapes of Trang An. Thibaut and his family, who stayed with us another week, during which Hoai and Nhung took advantage of Thibaut's presence to organise their future work, were taken to Bat Trang by Thao and Hoai. Before leaving, Thibaut offered us a wonderful book of astronomy images across centuries and continents, *Imago Mundi*, by Francesco Bertola.



*Di Li lecturing at the workshop*

Nhung and Hoai, following up on the work they had done in Paris at the end of last year, extended the study of their pet star, RS Cnc, to other similar objects, however less well observed. At the same time they made a simultaneous analysis of CO(1-0) and CO(2-1) data and completed a study of the asymmetry displayed by RS Cnc that they had started in Ha Noi last year and which turned out to reveal interesting detailed features. It has now been written as a paper submitted for publication in RAA. Such stars show us what our Sun will experience at the end of its life: a gigantic expansion preceding a rapid dilution in the interstellar space, leaving a ghostly cloud of gas, a Planetary Nebula, that will soon fade away and a very compact hot nucleus that will take forever before cooling down, a White Dwarf. This geriatric state of stars is still keeping secrets unveiled, in particular at the interface between the expansion and dilution phases, which are the object of intense studies and will be the topic of a conference in Vienna this summer where Nhung and Hoai will present their work. They get support for this from Thibaut and from the conference organisers who accepted to lift the conference fee for them. They both will leave for Paris just before the conference, after what they will spend the summer with Thibaut in the Observatoire de Paris. This year again, Nhung received some financial support from the Laboratoire International Associé (LIA) via CNRS/IN2P3, for which we are deeply grateful to Gabriel Chardin and Fadi Ibrahim. Hoai has already written a major fraction of her thesis, which she will defend in Ha Noi at the end of 2015.

Diep and Phuong have completed the writing and editing of three papers relating work using our radio telescope, two of which have already been accepted for publication (in Solar Physics, in the journal of the Astronomical Society of Australia and in Communications in Physics). Thao has joined Phuong to observe some weak sources – the current target is the Moon – and we see now the limits of the instrument as a research tool: it will soon be used exclusively for the training of students. Indeed, it is already used to train students with Dong and Diep helping Alain Maestrini with labwork sessions for USTH. Phuong, who passed with success the examination to enter the master student programme at the University of Sciences, has already written most of her master thesis. Thao and Phuong, together with two students in the first year of the USTH master “Space and Applications” who just joined us for a two month internship, started to concentrate on the analysis of a large sample of solar flare data that have been collected several months ago. This will probably be the last topical study using data from the radio telescope.

Diep attended the Quy Nhon conference on exoplanets in April. In contact with Di Li, he is now getting familiar with pulsar physics, which will be a highlight of the FAST (Five-hundred-metre Aperture Spherical Telescope) scientific programme on which he would like to work. He is reporting about it farther down in this issue. He gave astrophysics lectures to USTH students in their second bachelor year and, on behalf of the team, sent a request for support to Vinatom for maintaining and operating our radio telescope and scintillation and Cherenkov detectors.

Tuan Anh has now completed the writing of his thesis, a first draft of which has been handed out for comments. He also gave presentations on six topics more or less closely related to the subject of the thesis and obtained very good marks. He will defend his thesis in Ha Noi on November 1<sup>st</sup> and Nguyen Quang Rieu will join the jury on this occasion. Together with Frederic Boone, he had submitted a proposal to ALMA for observations of a quasar host at  $z \sim 3$  gravitationally lensed into six images, but the proposal has not been retained. We are currently exploring ways to continue doing research in this

field, which is both very interesting and very competitive, but it is difficult from Vietnam without a strong support from abroad. Scientists having the vision and generosity of a Jim Cronin, taking it as their pride to help with the development of fundamental science in developing countries, are rare. Tuan Anh is also getting familiar on existing possibilities of exploiting astrophysics data that are accessible to the public, in particular ALMA data that are supposed to be open for public use one year only after collection.

Dong is now leaving VATLY for a position at Vinatom, which our institute is part of, helping with the training of the young scientific staff. He has been progressively transferring to us his duties in relation with the maintenance of our instruments, radio telescope and electronics. We had a farewell dinner to thank him and wish him good success in his new task. We asked for Dong's position in the institute to be transferred to Hoai and we hope that our request will be satisfied.



*Thao at the defence of her thesis*

Finally, Thao completed the cycle of steps she had to go through to obtain her PhD degree with the successful presentation of her thesis work on June 30th. We congratulate her wholeheartedly. She is now fully concentrating on radio astronomy. It has been over a year between the time her thesis was printed and the award of the degree. A few years ago, the Prime Minister had declared his ambition to reach 20'000 PhDs by 2020. But words are not sufficient if they are not followed by actions. He should also have taken steps to reduce the harassment of the

paralysing bureaucracy that impregnates Vietnamese universities. But he did not. Instead, he left the yearly fee that students have to pay for the doctoral school rise to 13.5 million dong, meaning five months of salary for the members of the group. At the time of Diep and Nhung theses, the yearly fee was two million dong but the salary was only a factor of two lower! Namely, in eight years, the fee to salary ratio has more than tripled. This is a blatant illustration of the miserable state of Vietnamese higher education. De facto, children from poor families are excluded from it.

We attended a few interesting seminars, in particular by Michel Mayor on exoplanets, on his way back from the conference in Quy Nhon; Diep translated live into Vietnamese, as he had already done in Quy Nhon where Michel Mayor had given the same talk to a broad public audience. We also attended seminars at USTH, one by Eric Pantin on "The VLT/VISIR, ELT/METIS mid-IR instruments and high angular resolution observations of protoplanetary discs" and the other by Eric Nuss on "Overview of expected cosmology results from future wide-area spectroscopic surveys", after what we invited the speakers for lunch in a nearby restaurant.



*Pierre with VATLY team, his wife and Nafosted director, Do Tien Dung (at the extreme left)*

Pierre received the Vietnamese Friendship medal from the hands of Vice Prime Minister Vu Duc Dam, in a ceremony that took place in the context of the Science Day, which Nhung reports on elsewhere in this issue. He has been a member of the jury of the Ta Quang Buu Prize that was awarded to Professors Nguyen Ba An and Nguyen Huu Viet Hung on this occasion. He also has been

consulted on issues concerning the Vietnamese nuclear power plant, on which he says a few word in his report on the celebration of the thirtieth anniversary of the Da Lat research reactor to which he had been invited. He gave a public presentation of the book on the Higgs discovery that the team had helped putting together and that has now been published by Chu Hao.

Pierre and Diep also received a visit in a context that is worth mentioning in these columns, that of particle accelerators in the country. Vietnam is now hosting a few cyclotrons, one of which is operated by the Army for a major Ha Noi hospital. Currently it is only used to produce isotopes, but plans to use it for therapy exist. Nuclear physicists have a bad record of operating accelerators: they failed to restart the Ha Noi microtron after the departure of the Russians (who had given it from Dubna to Vietnam as a gift) and they currently fail to make good use of the pelletron that the university of Sciences acquired recently. No effort is being made at national level to train engineers and scientists having expertise in accelerator design, operation and maintenance; the skills of “machine physicists” are not recognized for their very high standing and their level of excellence as they should be. As a result, there exist no competence in the country in this domain, no effort is being made to create some and the management of the growing park of accelerators is in a bad state.

In an effort to refresh the decoration of our offices, Hoai, Diep and Nhung have been producing a set of photographs of the eighteen scientists who have been awarded a Nobel Prize in astronomy and astrophysics, each member of the team having the task to write a ten to fifteen line caption summarizing their work. We bought a few extra frames in prevision for the future...

In August, Diep and Tuan Anh will attend the 2014 APRIM meeting in Daejeon (Korea). This is the Asia-Pacific regional IAU meeting where they will present their work and for which they obtained support to cover their travel and living expenses during the conference.

We were very proud to learn about the election of our friend Professor Dam Thanh Son to the US National Academy of Sciences and we are happy to repeat here our wholehearted congratulations.

In two occasions, we invited to the laboratory personalities having outstanding experiences for them to dialogue with the team before joining us for lunch. One was Nguyễn Đông Hải, the younger brother of former Minister of Education and Vice Prime Minister Nguyen Thi Binh, who had a long experience in the Da Lat Institute and who told us about the early days of nuclear science in the country. The other was Dang Van Việt, Thao reports about his visit and exceptional destiny elsewhere in this issue.

On the geopolitical front, the recent aggressive harassment of Vietnamese fishermen by Chinese ships has triggered in the country a surge of nationalism that we, as scientists, hope to see fade away soon and be replaced by more friendly relations between the two countries.

### **THE RISE OF VIETNAMESE ASTROPHYSICS**

*Having heard in the workshop the presentation of the Vietnamese space programme given by the director of the Vietnam National Satellite Centre, Pham Anh Tuan, we felt that it was our duty to take stock of the encouraging message that it conveyed. Strongly supported by the foreign participants in the Workshop, we wrote an article to be published in Tia Sang, which we copy below. We managed to write it on time to have it discussed and endorsed by all participants.*

Astrophysics is on the rise.

The recent years have witnessed spectacular progress. How stars are born and die, how structures formed in the early Universe and have evolved to the web of galaxies that we observe today, are the subject of intense studies that are now revealing mechanisms that were unsuspected a few decades ago. Not so long ago, black holes were considered as a daring hypothesis; we now know of many, we have excellent reasons to suspect that there exists one at the centre of each large galaxy and we have acquired a detailed knowledge of Sagittarius A\*, the black hole at the centre of the Milky Way that weighs four million solar masses. Access to space has opened new windows on the Universe that we now observe at all wavelengths, from radio to gamma rays, and progress in microelectronics has revolutionized the collection, recording and analysis of images of the sky obtained from both

satellites and ground observatories. Evidence for the existence of dark matter, an unknown form of matter interacting only with gravity and impregnating the whole Universe, of which it represents nearly a quarter of the mass, has become ubiquitous. The study of the Cosmic Microwave Background, the radiation that was emitted half a million years after the Big Bang when atoms formed for the first time, has revealed a phenomenon of an unknown nature – we call it dark energy – that dominates the fate of the Universe but is not accounted for by known physics and manifests itself as a long range repulsive force that accelerates the expansion of the Universe. Just a few days ago, we learned that polarization studies of the Cosmic Microwave Background were likely to be telling us about the nature of gravitational waves that accompanied the inflation of the Universe immediately after the Big Bang: if confirmed, they would provide an exclusive probe of the so called Planck scale, where quantum physics and gravity are incompatible and require assembling a new set of physics laws.

Such is the context in which a small workshop brought together in Ha Noi, during the week from 7<sup>th</sup> to 11<sup>th</sup> April 2014, the few Vietnamese astrophysicists who are active in the field and a few of their prestigious colleagues from abroad: Professor Di Li from the National Astronomical Observatories of China, Professor Kazuhiro Sekiguchi from the National Astronomical Observatory of Japan, Professor Thibaut Le Bertre, from the Paris Observatory and Professor Young Chol Minh, from the Korean Astronomy and Space Science Institute. The Vietnamese research effort in astrophysics happens to concentrate on radio astronomy, which is at the forefront of modern research, largely the result of the legacy, training and encouragements of a Vietnamese radio astronomer, Professor Nguyen Quang Rieu, who spent most of his scientific career in France. It includes three nuclei, two of which are led by radio astronomers who returned recently to Viet Nam after several years of research in Taiwan, Professors Dinh Van Trung in Ha Noi and Phan Bao Ngoc in Ho Chi Minh City; the third nucleus is the young team of the Vietnam Astrophysics Training Laboratory (VATLY), who took care of the organization of

the workshop; they switched recently from cosmic ray research to radio astronomy, and include Doctors Pham Ngoc Diep and Pham Tuyet Nhung, together with three PhD students, of whom two will obtain their degree this year, and two master students. While Professor Dinh Van Trung is an internationally recognised expert in the study of the molecular gas content of the Universe, both circumstellar and interstellar, Professor Phan Bao Ngoc specializes in the study of brown dwarfs, at the border between planets and real stars. The VATLY team operates a 2.6 m diameter radio telescope tuned on the 21 cm HI line, used to train students, and currently studies a Sun-like star in its terminal phase and a galaxy of the early Universe that hosts a quasar. Professor Dao Tien Khoa, a well known nuclear theorist with keen interest in nuclear astrophysics, who is training two students in the field, took also part in the Workshop together with teachers of the Universities of Education in Ha Noi and Ho Chi Minh City, Doctors Nguyen Quynh Lan and Cao Anh Tuan, who carry the load of teaching bases of modern astronomy and astrophysics to future high school teachers and manage to conduct some research of their own. Also present was a PhD student from the Buon Ma Thuot University who studies ionospheric disturbances to the propagation of radio waves associated with solar activity.



*Discussion at the workshop. From left to right: Thibaut, Tuan Anh, Di Li, Thao and Tan*

The aim of the workshop was to exchange information on ongoing and future research projects, to foster closer contacts and possible future collaborations, to tighten links between active Vietnamese astrophysicists and to

consolidate existing links and/or create new links between astrophysicists from Viet Nam and from abroad, in particular from South-East Asia. In this context, the foreign participants described their own research work and placed it in the context of astrophysics research in their host institution and in their country. In addition to many existing observatories, both in space and on ground, several new facilities are under construction in Asia or under Asian responsibility, all of which offer opportunities for performing observations and accessing data at the frontier of current knowledge. The presence in the workshop, even if for only a short time, of all existing active Vietnamese researchers of the field was a success in itself and gave them opportunities to become more familiar with each other work. It was also a chance for the younger participants to present their own work, which was highly appreciated.



*Young Chol, Kaz, Pierre and Ngoc*

A highlight of the workshop was the presentation by Doctor Pham Anh Tuan, director of the Vietnam National Satellite Centre (VNSC), of the Vietnamese space programme. Satellites play an increasing role in the modern society, whether for observation, communication, localisation or research, and Viet Nam has an ambitious programme in this domain. In the wake of it, Dr Tuan described with enthusiasm his plan for a National Observatory that would include, in particular, a planetarium and a telescope. He strongly encouraged the audience to join him in the effort of making this project a reality by bringing with them their experience and their skills. The project was perceived by the participants as a strong sign of the determination



*Director of VNSC, Dr Pham Anh Tuan*

of the Government to invest effort and resources in a field of science that spans across fundamental and applied research and that is currently at the very frontier of modern technology and front line science. This encouraging message was received as a unique opportunity to give it a clear, positive and responsible response. Responsible means a serious assessment of what is implied, in consultation with all members of the small community of Vietnamese astrophysicists and taking proper advice from experts abroad. A priority is to understand the time scale implied by putting together the community that will be able to use, operate and maintain such facilities. Such a community must be built on the basis of existing skills and talents and adequate resources must be freed to allow them to grow up to the critical level that is required for a responsible management of the planned project.

The foreign participants to the Workshop were unanimous in encouraging the Vietnamese astrophysics community to catch the opportunity that the future National Observatory project represents in a pioneering spirit of dedication, enthusiasm and energy. They stated clearly that the Workshop had been for them an opportunity to witness that the existing community, in spite of its small size, has in hand the assets to grow soon to the level required if they are given proper support. They substantiated their encouragements by stating their willingness to help such an effort by a number of actions such as sponsoring regional collaborations and possibly offering postdoc opportunities. Moreover, they declared their willingness to put their assessment in writing if it could be of some use to those in Viet Nam

who have power to make decisions and to free resources.



*Pierre, Trung and Di Li*

Time has come for Vietnamese astrophysics to take off. Vietnamese science and technology has a lot to gain in such an endeavour. The International Astrophysics community, in particular via the International Astronomer Union (IAU) that has been sponsoring the workshop, has a long history of helping the promotion of astronomy and astrophysics in developing countries. Time has come for Vietnam to join it as an active member and take full benefit of the invaluable network of expertise and support that it offers in a pure spirit of scientific and academic tradition. Opportunities for collaboration and support in the domain of space technologies exist at the regional and international scale, time has come to expand our relations with countries offering such opportunities and make an increased use of these. Several countries in the region, particularly Thailand, are giving growing attention to the progress and development of space science and technology; it is time for Vietnam to occupy the place on the regional scene that its potential of skills and talents should enable it to reach. Plans for a National Observatory have received governmental support. In the country, it has been received with enthusiasm and perceived as a very positive sign of confidence and a clear step forward. Abroad, it has triggered much sympathy and the expression of a strong willingness to help. Time has come to set up an international advisory committee that could give the project the boost it deserves. Time has come to take up the opportunity by raising the present astrophysics

community to a size and a level of competence that will enable a responsible management of such a project. The talents exist with the necessary reserves of determination and energy, time has come to give them a chance to blossom. Time has come to listen to the encouragements voiced from abroad and to take seriously their positive assessment of the potential skills and promises of the young generation of Vietnamese scientists.

### ***THE FAST RADIO TELESCOPE***

*A giant radio telescope is in construction in nearby China. Diep reports.*

The Five hundred meter Aperture Spherical Telescope (FAST) is a radio telescope under construction in a natural basin, a sparsely populated –and thus radio-quiet– region, in Guizhou Province, southwest China, ~600 km away from Ha Noi. Completion is expected for September 2016, it will then be the world's largest and most sensitive radio telescope.

The telescope was first proposed in 1994. An international review and advisory conference on the science and technology of FAST, held in Beijing in 2006, concluded that FAST was feasible. In October 2008, the project was approved by the Chinese National Development and Reform Commission. On December 26, 2008, a foundation laying ceremony was held on the construction site. The approved funding budget for FAST sits at CNY 700 million (approx. 110 million US \$).



*FAST: 3D model*

The design of FAST follows that of its predecessor in Arecibo (Puerto Rico), which was completed in 1963 and has since been the largest

single-aperture radio telescope ever constructed, with a diameter of 305 m and a collecting area of 73,000 square meters. When completed, FAST will be able to see more than three times farther into space, have roughly 2½ times a collecting area and survey the sky ten times faster.

Unlike Arecibo, which has a fixed spherical curvature focusing radio waves into a line above the dish, from where they are further focused to a single point by more mirrors, FAST's cable-net supporting structure will be able to deform the surface in real time by active control. This method will shape a subset dish made of 4,600 triangular aluminium panels, nearly the size of the entire Arecibo dish, into a parabolic mirror anywhere within the larger bowl. This implies that the telescope will not be restricted to pointing to zenith, but will have the ability to cover the sky down to 40° zenith angle with a pointing accuracy of 4". The working frequency will range between 70 MHz and 3 GHz, making it possible to resolve sources only 3" across. Such a resolution – while not as good as interferometers such as VLA or ALMA – is unprecedented for a single radio receiver.



*FAST: Status of the construction work, June 2014*

Its unparalleled sensitivity and high surveying speed will allow FAST to survey neutral hydrogen in the Milky Way and other galaxies, to detect new pulsars (both galactic and extragalactic), to search for stars being formed and for extraterrestrial life.

Once operational, FAST will be operated by China's National Astronomical Observatories, under the auspices of the Chinese Academy of Sciences. We are in contact with Dr Di Li, chief

scientist at the National Astronomical Observatories and Principal Investigator of the project, who attended the Ha Noi workshop in April and gave a presentation of the project.

### **30th ANNIVERSARY OF THE DA LAT REACTOR**

*In April, Pierre was invited to Da Lat for the celebration of the 30<sup>th</sup> anniversary of the Da Lat Nuclear Research Institute, which hosts a small research reactor. He briefly comments on the event.*

In 1958, in the frame of Eisenhower's Atom for Peace program, Viet Nam ordered a General Atomics Triga II research reactor which diverged in 1963 and was operated in Da Lat together with US staff (it was after the Geneva Conference and Da Lat is south of the 17<sup>th</sup> parallel) for a few years before being dismantled when the war escalated under President Lyndon Johnson. After the reunification, the reactor was refurbished and upgraded to 500 kW in the early eighties by the Russians and in 1984, the Da Lat Nuclear Research Institute started functioning with Pham Duy Hiên as its first director. During the past 30 years, the reactor has been operating safely without incident. It is being used efficiently, for radioisotope production, activation analyses, nuclear reaction studies, training and development. It is equipped with a number of thematic laboratories that have been progressively created and developed. The Da Lat reactor is a scientific success story of which Viet Nam can rightly be proud. Its staff has gained invaluable experience in the understanding and mastering of reactor physics and has acquired both scientific and engineering skills of outstanding quality.

Viet Nam is committed to the construction of major nuclear power plants, for which agreements have been signed with Russia (4 GW in Ninh Tuan) and Japan (4 more GW, also in Ninh Tuan). Until recently, the hope was to reach 15 GW by 2030 and 20 to 25% of the total energy demand by 2050. However, a major concern, repeatedly expressed by the few Vietnamese having competence in this domain, is that we are unprepared for the event and, for now fifteen years, we have proven unable to train the team of engineers and scientists required for the task. This



lack of preparation has already caused a six year delay in the program, announced in January this year, irremediably associated with important cost increases.

The United States had Oak Ridge and Argonne, Soviet Union had Obninsk, United Kingdom had Harwell, France had Saclay, Viet Nam has no institute in which to centralize the effort. Instead funds are distributed among a multitude of ministries where they are mostly wasted for other tasks. The United States had Enrico Fermi and Walter Zinn, Soviet Union had Kurchatov, United Kingdom had Cockcroft, France had Joliot-Curie, Viet Nam has a committee but no one is in charge.



*Da Lat research reactor building*

Da Lat is the only place where expertise exists, it could have been used as the seed to create a team of competent scientists and engineers, but it has not. It was seen from the capital as an institute doing good research with little support, but having no relation with nuclear plants. If we had launched there, fifteen years ago, a serious training program, we would have today a team of competent engineers and scientists of the required level.

But there now seems to be hope for a change. During the Da Lat celebration, in the name of the Minister of Sciences and Technologies, his deputy Lê Đình Tiên praised the Da Lat Nuclear Research Institute for its achievements during the past thirty years and for the asset represented by its staff [...] “in view of a successful implementation of the nuclear power development program”. He added that “in order to implement it the Ministry has been given the important task to establish a

large Centre aimed at enhancing the national nuclear infrastructure [...] and at training a staff having the ability [...] to build, operate and maintain safely and efficiently nuclear power plants.” He concluded by asking the Vietnam nuclear community “to devote more manpower, brainpower and time [...] to speed up the implementation of the project”. These encouraging words seem to show the determination of the Minister at adopting a new and more aggressive style, at making at last good use of the investment of thirty years of excellence in Da Lat and at creating a big Centre in which to concentrate the skills and talents required for the task.



*Da Lat research reactor*

We, as scientists, must feel responsible for the success of the project and be concerned by the somewhat alarming current situation. The day the Government and the population will realize that Viet Nam is losing its independence in terms of energy or the day there will be a major nuclear accident, they will rightly turn to us and blame us for not having prevented it. It is time to make the Government conscious of the pressing need to change style and to help the Minister of Science and Technology with the prompt establishment of the new Centre.

### **SCIENCE DAY AND RELATED EVENTS**

*Nhung reports on the 2014 Science Day, which was celebrated in Viet Nam for the first time.*

It was good news for Vietnamese scientists to read, in the recently approved Science and Technology Law (2013), that Vietnam will have

its yearly “Science and Technology Day” on May 18<sup>th</sup>: “*The Vietnam Science and Technology (S&T) Day is aimed not only at honouring scientists and S&T achievements, advocating, disseminating scientific knowledge but also at improving awareness and raising the pride of Vietnamese intellect, spirits of addicting to innovative work among social classes, especially Vietnamese young generations in the process of the nation’s construction and protection*”. This year Vietnam S&T Day was held for the first time with the theme “*Science and Technology – motivation for a fast and sustainable development*”. On this occasion, many events and activities took place all over the country.



*At the S&T exhibition*

The main event was the announcement ceremony of the Vietnam S&T Day, organized by the Ministry of S&T, on May 18th at the National Convention Centre in Hanoi. In the speech delivered on this occasion, Prime Minister Nguyễn Tấn Dũng emphasized that S&T “*is the leverage for the process of restructuring the economy, improving its productivity, quality, efficiency and competitiveness with the objective of making Vietnam soon become an industrial country*”. The National Convention Centre was open to the public on that day, with an exhibition displaying introductions to various scientific activities and outstanding S&T achievements over different periods of Vietnamese recent history. An event attracting much attention from Vietnamese scientists was the award ceremony of the first Ta Quang Buu Prize on May 17<sup>th</sup>, attended by over 300 scientists. The Prize will be given each year to honour Vietnamese scientists who have made

outstanding achievements in their field and produced excellent scientific publications. The aim is to promote fundamental scientific research as well as S&T development in the country. Ta Quang Buu (1910-1986) was born in a family of school teachers in Nghe An and attended high school in Hue and Ha Noi before being trained in France in mathematics and theoretical physics. He joined the revolution, and later the resistance, attended the 1946 conference in Fontainebleau and was appointed minister of the new republic, first of Foreign Affairs, then of Defence. After Dien Bien Phu, he dedicated his whole life to the development of higher education and training in the country.

This year, two scientists were honoured: Prof. Nguyen Huu Viet Hung (HUS) for his work on “*The homomorphisms between the Dickson-Mùi algebras as modules over the Steenrod algebra*” and Prof. Nguyen Ba An (IOP) for his work on “*Joint remote state preparation via W and W-type states*”.

Speaking at the ceremony, S&T Minister Nguyen Quan expressed the wish that “*the award will become increasingly prestigious over the years and diffuse deeply within the S&T community, encouraging the nationwide promotion of creativity and passion for scientific research.*”



*Deputy Prime Minister Vu Duc Dam (centre) and recipients of awards (Minister Quan and Pierre at the extreme right).*

Also honoured at the ceremony, were senior S&T managers. Pierre was awarded the Friendship Order to acknowledge his contribution to the training of young scientists in Vietnam. This made us, the young VATLY members, very happy and proud.



*Space day, an introduction to the Vietnamese satellite programme (up) and a visit to the data acquisition station (down)*

Among the many activities organized for the Science Day, such as conferences, meetings, workshops, techmarts, etc the most exciting for us was laboratories of universities and research institutes opening their doors to the public. Many countries have a long and successful experience with such events, aimed at giving an opportunity for scientists to bring their research work closer to the public, and for the public to know more about science and its role. But for us, it was a “première”. Due to the short time of preparation, two large institutions, Vietnam National University (VNU, including University of Science and Universities of Technology in Hanoi and Ho Chi Minh city) and Vietnam Academy of Science and Technology (VAST, including about 40 institutes and centres), had been invited to open the doors of their laboratories. It was announced that more than hundred laboratories were concerned. VATLY had prepared for the event but INST/VINATOM was not invited to join. Our members spent time to visit some laboratories of

VAST and VNU. We enjoyed learning about other people's work and meeting many students and visitors interested in science. Although some labs were not well prepared to welcome visitors, we met many young researchers who were very enthusiastic to introduce us to their work.

There were some very interesting events, which attracted many students, scientists and visitors, such as the “*Space day*” organized by the Vietnam National Satellite Center (VNSC) and “*A day with math*” organized by the Institute of Mathematics (IM). “*Space day*” started with a general presentation on space science and technology. Particular attention was given to its development in Vietnam where it has been recently introduced, including a Vietnam Space Center project in Hoa Lac Hi-Tech Park, and a plan on satellite technology development and application until 2020. Many questions were raised by the audience on the Vietnam-made micro satellite that had been launched last year and projects on space technology & applications. Visitors also had chance to learn about opportunities to study and work in the field of space and satellite technology, exchange with staff involved in space technology projects, and visit laboratories where micro and meteorology satellites are on display.



*A day with math, space geometry for children*

“*A day with math*” aimed at introducing mathematics to people of all ages. It included talks about the beauty of mathematics, showing movies about famous mathematicians, an exhibition of mathematics images, puzzles and games for children. Most activities were run by young

researchers of IM with the support of seniors. More than hundred people including children joyfully attended this event. There was also a round table discussion on developing mathematics in Vietnam for mathematicians and lecturers from all over the country.

We were very happy to witness the first Vietnam Science Day. We hope that our lab and many others could take part in this interesting event next year. We also hope very much that “Open days”, more than opening the doors of laboratories, will open a gate to science in the country and that the Science Day will become a festival for everybody.

### VISIT OF DANG VAN VIÊT

*In May, we were honoured by the visit of Dang Van Viêt, a man of exception whose life summarizes a century of Viet Nam's history, its tragic destiny and the throes of its people. He is the grand-son and grand-grand-son of famous high rank intellectuals of the feudal regime. His father was a Minister of Bao Dai, a progressive patriot, who managed for the August 1945 revolution to go smoothly in his province without blood being shed, which was properly acknowledged by Hô Chi Minh. However, the purges of the 1953 land reform did not spare him and his wife, and decimated or forced into exile the rest of the family. Only much later did Viêt, who meanwhile had joined the Resistance, learn about it. Aged 22, he had left Hue for Ha Noi to study medicine but the Japanese putsch of March 1945 prevented him to do so. That year, a major famine, which French and Japanese were responsible for, causes the death of two million Vietnamese in the North. Viêt enrolls to help with collecting the corpses, an experience forever imprinted in his heart. Back in Hue, he decides to join the ranks of Viêt Minh and is given the mission to take the flag down the main mast of the imperial city and hoist instead the golden star red flag. Two days later, Bao Dai abdicates and Viêt wins fame in catching a French commando that had been parachuted over Hue by de Gaulle to contact the imperial regime. From success to success, he climbs quickly the military ladder and is put at the head of the south Laos front before joining the headquarter of the Laos highlands*

*where malaria is endemic. His unit is decimated and himself must be sent back to Ha Noi where he is given good care and recovers health.*

*The campaign of liberation of the north-east border, from 1947 to 1950, is at the peak of his military career. He conducts famous ambush operations on the colonial road number 4, from which he earns the nickname of “Tiger of RC4”, and in August 1949 is appointed head of an elite regiment, strong of over 5000 men and equipped with heavy artillery and anti-aircraft defence. He immediately neutralizes a French convoy at Bong Lau pass, in a famous battle, and takes hold of Dong Khe's French stronghold. His many exploits win him admiration and respect from his men as well as from his enemies.*



*Dang Van Viêt in 1950.*

*But back from the front, he has to face the great terror of the land reform. Instead of celebrating the young victorious soldier – he is just over thirty – one sends him to China to follow training courses for Vietnamese infantry officers. Under Chinese pressure, Viet Nam lives through some of the darkest pages of its history, which Hô Chi Minh deeply and publicly deplored later on. It is indeed the shame of the young Vietnamese nation, when denying that because of one's parents one can be entitled to privileges, to claim that on the contrary, because of one's parents one must be persecuted. It is only ten years later, when*

back from China, that Viêt learns the fate made to his family.

In 1960, he is demobilised and appointed as second-in-command of a service of the ministry of construction. He then decides to follow engineering courses at university and obtains a degree. Forced to retire when he reaches 60, the forgotten soldier lives in a state of utter destitution, having to grow vegetables from a small piece of land that he got from his wife and selling them in the market. He then dedicates himself to writing, first his memoirs, then a broad fresco of Viet Nam's military history. While sometime indulging in showing some bitterness, in confessing his sadness of having been judged on his blood rather than on his actions, he remains incredibly serene and indulgent toward a regime and a Party that have proven so unfair and so cruel to him. The day he reaches 80, he writes these lines: "So many events, so many upheavals, some emerging, others fading away in a mix of ordeals, of dangers and of moments of glory, of joy and sorrow, of gains and losses. But more joy than sorrow, more gains than losses. I feel unworried because I lived a free life, depending from no one. I have been slave of no futile or pointless passion, of no frivolous pleasure. I never engaged in the exhausting pursuit for money, for honours, for medals or for degrees. I never yearned for climbing the social ladder. For nearly fifty years, I never was granted any advancement, promotion or salary increase. But this did not cause any sadness or torment. I grew up in the shame of an enslaved motherland and of a people in great distress. My dearest wish was to fight the occupier for our nation to become free and independent, for our people nevermore to suffer from cold and hunger, for our society to become fair and civilized".

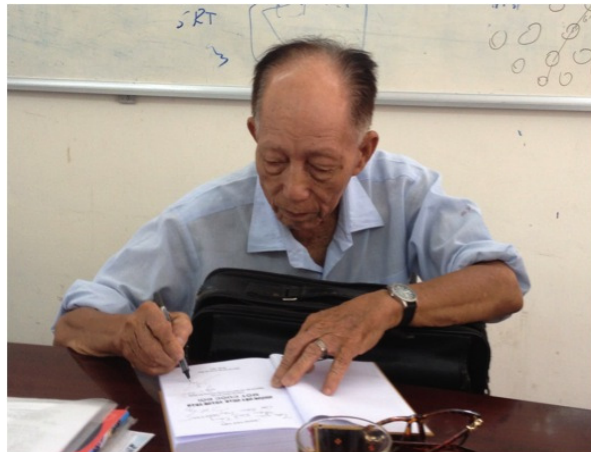
Recently, however, on the occasion of the revision of the Vietnamese constitution, he openly criticized the Party as it has now become and the ruling of the Politburo over the government.

*Thao reports on his visit to VATLY.*

We had the honour to welcome Dang Van Viet in our lab on a hot summer morning. As we had heard about him from Pierre and from reading

his memoirs, we were very happy to have a chance to meet him and listen to him.

He told us about his youth. Education was taken very seriously he said, many students would study fundamental science and hope to follow the examples of prestigious scientists such as Nguy Nhu Kon Tum or Ho Dac Di. But he felt that he could be satisfied with a less ambitious goal, what mattered most for him was to do something that would be of use for the people around him. He felt that the duties imposed on him by the legacy of his ancestors and family as well as by his loyalty to his friends and to the nation were heavy enough a burden. In war time, he said, we all knew that we might die any moment; we were looking at life with a different eye as we do today in peace time. His regiment had caught many war prisoners and his comrades wanted him to simply kill them. But he refused and did his utmost to treat them with dignity and to feed them as his own soldiers in spite of the general state of starvation that they all had to endure. He wanted to be faithful to the words of Hô Chi Minh and Nguyen Trai: "Making ten thousand prisoners free will stop war forever".



*Dang Van Viêt at VATLY, signing one of his books*

He told us about his fight for more justice when peace had been restored, his insistence at obtaining the rehabilitation of the honour of his father, his action in favour of his friend, former Vice Deputy Prime Minister Doan Duy Thanh. More recently, he commented on the 10<sup>th</sup> Congress of the Party, in 2006, during which the role of the Central Committee in decision-making was strengthened, and that of the Politburo weakened. He also told us about his stand in

favour of a revision of the constitution toward removing the primacy of the Party.



*Dang Van Viet with the VATLY team*

He said that in France there have been some thirty publications mentioning the battles and ambushes that he had conducted on Colonial Road number 4, but that in Viet Nam there had not been a single one. This made him devote much time and effort to writing about them in order to make sure that they would not sink into oblivion and leave a track in the military history of Viet Nam. In the wake of this work, he said, he undertook the writing of a military history of the country.

He also confessed how sad and disappointed he was by the ubiquitous corruption which the country was suffering and the paralysing complexity of the organisation of the state that was encouraging bureaucracy and preventing progress.

As we were telling him that we, the youth of today, were enjoying peace and freedom but were not given a chance to fight, as he had done, for some exalting ideal, he took this comment very seriously. Viet Nam, he said, is suffering a very alarming brain drain. We send students to be trained in France or in the States and they do not come back, they stay over there, their talents are lost for the country. Too many young people, he said, choose to work in finance, banking, foreign trade and management; too few are attracted by sciences. This is a bad sign for the development of the country and will lead toward the dependence of our economy from other nations.

He kept reasserting his loyalty to the spirit of what the Party had meant for him in restoring freedom and independence and that he was proud of having taken part in this fight for peace; it was sufficient to make him happy of his life. I do not mean to give my life in example to the youth, he insisted, the young people of today have to face the changing world with realism and decide by themselves what they can do to serve the progress of humanity.

He kept telling us what a beautiful country is Vietnam, with a rich history and culture, and developing so fast while being still in need of so much more. He said his confidence that the nation will keep progressing and encouraged us to take active part in this progress.

We thank him from the deepest of our heart for having shared his thoughts with us in such a friendly way.

### ***LETTER TO THE SPOKESMAN OF THE PIERRE AUGER COLLABORATION***

*We copy below the letter that Pierre has sent in the name of the team to the spokesman of the Pierre Auger Collaboration, Karl-Heinz Kampert, and the answer that we received. Our debt to them is immense and our gratitude cannot do proper justice to it. From now on, VATLY will stand for Vietnam Astrophysics Training Laboratory.*

Dear Karl-Heinz,

I am writing in the name of the Ha Noi team. For now three years, we have progressively shifted our interest from cosmic ray physics to radio astronomy. Our contribution to the Pierre Auger collaboration has declined accordingly up to reach a point where it has now become negligible. We had discussed our situation, over a year ago, with Antoine Letessier-Selvon who is representing the French contribution to the collaboration and has been acting as our godfather in Auger. We agreed at the time that it was better to wait until Summer 2014 to formalize our decision to leave, in order not to interfere with the ongoing discussions on the future of the collaboration and of the observatory. Time has now come to do so.

What we owe to the collaboration is immense, what we gave it is very little. Without Auger, we would not have had a framework in which to grow and come of age. In Vietnam, support to fundamental science is very low and to simply survive requires lots of determination, patience and courage. Having friends abroad, in the international scientific community, is immensely helpful; first as a moral support, which we most need, and also as a material and financial support.

The Auger observatory is a beautiful instrument, of a perfect design. Nature has not been very kind to us in making UHECRs less accessible than we were legitimately authorized to think. The road toward finally revealing all their secrets is still long and difficult. A young team as ours lacks the assets that are needed to embark on it with reasonable chances of success. We need to work on a much shorter time scale. We have barely reached a critical mass, our future is still fragile and has to be consolidated.

Radio astronomy, on the contrary, matches much better our needs. Moreover, there exist already two active radio astronomers in Vietnam, one in Saigon and one in Hanoi. Currently, some of us work on the mass loss mechanism of AGB stars, others on host galaxies of high redshift quasars, and we have a small radio telescope at home tuned on the 21 cm hydrogen line.

Please be kind to tell the collaboration our deepest gratitude for all what they gave us, both as physicists and as friends. It is the pride of Auger to help teams from developing countries, it was the intended ambition of Jim Cronin and Murat Boratav, it was the expression of their vision and of their generosity as scientists. It is most wholeheartedly that I express our gratitude to you and to all our friends in the collaboration.

In the name of the Ha Noi team, I wish you much success in the pursuit of this research,

With kindest regards,  
Pierre

Dear Pierre, dear Auger-Group in Hanoi,

I am very sorry to hear about this, even though, it doesn't come as a surprise after we have talked about it in Quy Nhon. As usual, you are too modest in assessing your contributions and your

impact. Starting up a fundamental science and education program in Vietnam in the context of Auger has been great for Vietnam and has been considered also a very positive and important aspect of Auger itself. This comes on top of the intellectual contributions by you and your group. I very much enjoyed seeing some of you last year at the inauguration meeting in Quy Nhon which gave me the opportunity of getting some direct feeling about the enthusiasm of Auger collaborators.

Yes, we have not yet solved the question about the origin of UHECR but we have done great science and we are in a pole position of addressing this particular question in the near future. We are enthusiastic about the science goals to be addressed with the upgrade and we are optimistic also about the receiving the required funds.

Let me convey to you personally and also your team our deep thanks for working together in this enterprise for almost two decades and let me wish you all the best on your new projects in radio astronomy. The return doors to Auger will remain wide open in case there is some opportunity for you.

With our best wishes,  
Karl-Heinz

### ***A MISSING INTERVIEW***

*Following the tradition of having Diep and Nhung interview a respected personality, as was done for all previous Newsletters, we contacted this time such a person, the identity of whom we shall not reveal. The person having asked us to communicate to him/her the questions that we should like to ask, so did we. Here is the list:*

1. In countries that are successful in sciences, scientists enjoy a status in the society that is different than that in Vietnam, they are respected and earn enough money to have a decent life, yet not too much to make sure that they choose to become scientists by passion for science and not for earning money. They enjoy the support of administrative services that are there to serve them and not to control them. How and when do you think that Vietnam will reach such a state, or at least start moving toward such a state?

2. We understand that Vietnam, in its current state of development, needs to give higher priority to applied research than to fundamental

research. Yet, it is well known that no good applied research can be done without the support of some fundamental research. How do you think that we may succeed to make it clear to our authorities, to make them understand that they must already now support some fundamental research as long as it is of excellent quality?

3. Nafosted has been a big step forward in securing more justice in the selection of projects supported. Yet, it needs to improve its way of functioning, for example by giving less importance to the quantity of publications than to their quality, possibly including foreign members in their ranks in order to improve objectivity, etc... Do you have comments on this point?

*At the last moment, too late for us to choose another victim, he/she told us that he/she had to decline our offer. We find it interesting, for our readers, to summarize the reasons that he/she has invoked, in full respect of the confidence that we owe him/her. He/she felt so closely concerned about these issues that he/she was afraid to attach too much emotion to his/her answers and felt that he/she could not answer our questions as freely as he/she would like. He/she remarked that our questions relate to very basic features of our society and that the solutions of the problems implied require major changes. He/she also said that fixing small things here and there, step-by-step would lead nowhere and that we must be pragmatic rather than dogmatic.*

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Issues 1 to 20 of VATLY's Newsletter are available from our web site where you can also find general information concerning VATLY such as membership, list of publications, etc...

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



–PHOTO ALBUM–



Group picture at the workshop. From left to right: Phuc, Tuan Anh, Pierre, Thao, Phuong, Hoai, Young Chol Minh, Kaz Sekiguchi, Thibaut, Dinh Van Trung, Di Li, Khoa, Tan, Nhung, Lam, Quynh Lan, Cao Anh Tuan and Diep



At the workshop, Kaz and Pierre



Di Li, Tuan, Tan and Phuc at the workshop during a coffee break



At lunch during the workshop



Dinner at the old square



*Thao with the jury members and her family*



*Thao with family and friends*



*Science day at VAST: a rocket that can reach 300m in altitude*



*Science day, at the Natural sciences museum of Hanoi University of Sciences*



*Michel Mayor lecturing on exoplanets, with Diep translating*



*Pierre being interviewed in front of our newly decorated wall*



*Students from Hanoi University of Technology looking at our radio telescope*



*At lunch with Dang Van Viêt*



*Thao after the defense of her thesis, together with Hoai, Phuong and Nhung*



*Dong's farewell dinner. Left to right: Phuong, Dong's wife, Dong's son, Diep's son, Dong, Pierre and his wife*



*Diep, Di Li, Nhung and Tuan Anh visiting Trang An, Ninh Binh*



*Di Li and Diep in Trang An*