

VATLY NEWSLETTER

CONTENT

With the delivery of this fourth issue of **VATLY NEWSLETTER** we wish you all a very happy and successful year of the Rooster!

After the traditional **NEWS FROM THE LABORATORY** you will find an interview of Professor Bach Thanh Cong. He tells us about **PHYSICS AT THE NATIONAL UNIVERSITY**, which he is heading, with particular emphasis on the future introduction of astrophysics in the cursus. Dong reports on a visit paid by the group to **ITIMS**, the International Training Institute for Material Sciences, located in Hanoi University of Technology. Diep remembers of the 11th edition of the Vietnam School of Physics (**VSOP11**) that was held in Da Nang between Christmas and New Year and Thao of the 9th Asian Pacific Physics Conference (**APPC9**) that took place in Hanoi in October.

NEWS FROM THE LABORATORY

A fair fraction of the four past months has been spent in academic activities: lectures, conferences, schools, leaving less time than average for research. All members of the group have passed successfully their examinations.

In addition to the standard university courses of the master programme, lectures have been given at the Institute by Khoa on nuclear structure and by Pierre on astrophysics and particle physics. After the summer conferences, (RDV and APPC, both concerned with astrophysics) we spent several Wednesday mornings going through and commenting a series of recent astrophysics articles describing new observations. Now, we listen instead to Nhung and Diep repeating Pierre's Da Nang lectures on particle physics (teaching being the best way of learning...). Following his visit to the Rector of the National University, Pierre was offered a visiting professorship and is now introducing second and third year students to astrophysics. The whole group attends these lectures on Friday mornings, Diep and Nhung acting as tutors to their younger colleagues.

The APPC9 conference was an opportunity to present VATLY to physicists from many Asian countries, especially from Japan that had a particularly strong presence at the Conference.

The Da Nang school of physics (VSOP11) was attended by the whole group and a miniseminar was presented by each of its members. Compared with last year's school of the same series, it was rewarding to measure the progress made by the VATLY team in one year.

Huyen has now been on sick leave for several months, we miss her very much and we strongly hope that she will soon be able to be back with us.



Celebrating Women's Day in the Lab

Nhung has completed her study of the response of our Auger Cherenkov counter to muons. She has written it down in an internal note and has presented her results orally to the group. She has also completed, written down and presented a search for muons stopping in the last layer of our hodoscope. Using both the time of flight information and the characteristic Bragg shape of the energy loss distribution, she has been able to isolate a signal of only 20 parts in a million. She is now working on real Auger data, trying to understand the time structure of the FADC traces.

Dong has completed the study of afterpulsing that he had started with Huyen. It has also been written down and presented. Clear evidence was found for afterpulsing in nearly all our phototubes that are often over thirty years old. Photoelectrons ionize the residual gas inside the glass envelope and the positive ions drift back to the photocathode where they produce new photoelectrons. He has also assembled and tested a scintillator hodoscope that will be placed on top of the Auger Cherenkov counter in order to ease the muon lifetime measurement.

Diep and Thao have developed a toy Monte Carlo programme with which they have studied the main features of the behaviour of the fluorescence detector. This turned out to be a much richer subject than anticipated and writing down the results is not quite finished yet. As soon as it is, they will continue with a comparison of the main systematic uncertainties attached to the shower energy measurement in the surface and fluorescence detectors respectively. They have also been busy with refurbishing our web site which is now kept up to date.

Thieu has finished writing down his PhD thesis and will soon present it in front of the VAEC panel. He has been very busy with an electronics project in collaboration with Malaysia in which his lab is involved.

Thuan travelled to the United States in January, together with a representative of the Ministry of Science and Technology, and visited Jim Cronin and Angela Orinto in Chicago. He also stopped in Virginia to pay a visit to Pham Quang Hung and Trinh Xuan Thuan whom he invited to visit Ha Noi.

Khoa has been working on the organisation of a week of lectures to take place in the Institute at the end of September. The idea is to take advantage of Asialink, a programme of the European Community in which several of his collaborators are involved. They will meet in the first days of October in Beijing and some of them will stop in Hanoi on their way to the meeting and lecture at the school. In particular Tiina Suomijarvi will lecture on the detection of cosmic rays. As Catania is part of this programme – and in fact coordinating it – and is also a member of the Auger Collaboration, we will take this opportunity to initiate contacts with them. With financial support from Asialink we hope to be able to send Nhung and/or Diep spend

one month or two in Catania. Also, with financial support from the French CNRS, we hope to repeat this experience in Paris, at IPN Orsay (Tiina Suomijarvi) and/or Jussieu (Murat Boratav).



Birthday's Party at Pierre's home

We have received material as gifts from Riken, Saclay and Photonis. Riken (Atsushi Yoshida) and Saclay (Bernard Peyaud) have sent us 2 " phototubes and some Camac units, both of which will be extremely useful. Photonis, the manufacturer of the Auger photomultiplier tubes, has sent us twelve Auger surface detector phototubes that had been rejected for being slightly non linear. This is a really superb gift for which we are deeply grateful to the firm and to Pascal Lavoute, head of the R & D department, who is responsible for it. The tubes have just arrived at the Institute and will now be installed on our Cherenkov counters. Dong and Thieu will take care of the work that is implied.

PHYSICS AT HANOI NATIONAL UNIVERSITY (VNU)

Diep, Nhung, Thao and Dong have interviewed Professor Bach Thanh Cong, the Head of the Faculty of Physics at Hanoi National University. They report below.

VATLY: Professor, could you please tell us about our faculty?

Prof CONG: The faculty of physics was created in 1956. At that time, it had a staff of 95, including permanent and long-

term contracts, of which 68 were lecturers, the rest being technicians or researchers. During its fifty year life, it has trained many scientists, some of whom are now holding leading positions in universities, institutions and research centres all over the country. The normal cursus extends over four years and there are of the order of 750 students in total. The students are distributed in classes of typically 80 or so for the first three years. In each promotion, special classes exist for the best 15 students (60 in total), who form the so called honour program, and for 50 or so students (200 in total) who study to become teachers. The programme of the first three years of study is the same for all classes, but in the fourth year the students split into nine different classes specialized in specific domains and corresponding to the nine departments of the faculty: theory, general physics, condensed matter, geophysics, quantum optics, nuclear physics, low temperature physics, computing and electronic engineering. We also have a material science centre and an applied physics laboratory.

In addition to this mainline programme, there are about 100 master students, 20 PhD students and 300 secondary school students (for the three last years of secondary school).

VATLY: Professor, what about research facilities? How much research is being done in our faculty and how many publications does it generate in journals of international audience?

Prof CONG: The research facilities are quite good if you compare them with what exists in the rest of the country, but in fact quite weak when assessed at world and Asian region standards. The main research facilities have a materials science orientation but equipments for other fields (nuclear, optics, electronic engineering, physics of the earth) are very poor. Students have very little time to practice. There are too few laboratories and they are not well equipped.

For example, in the general physics department, there are only ten tutors to train more than 2000 students (including students from other faculties, colleagues inside VNU whom we have the responsibility to train) in only five rooms. The Low Temperature Physics department and the Material Science Centre are better off. The latter is indeed a modern laboratory with instrumentation that allows for doing good research work in the field of magnetic materials. We are involved in some national projects and we collaborate with foreign laboratories via a number of international cooperation programmes. Between the middle of 2003 and the end of 2004 we have published of the order of 50 articles in journals of international audience.

VATLY: Could you tell us more about these collaborations, whether national or international?

Prof CONG: An example of a particularly successful collaboration is between the low temperature physics department and the faculty of physics of the University of Amsterdam. It started more than 27 years ago and produced of the order of 20 PhD's. Many common publications have appeared in international journals like Journal of magnetism and magnetic materials and Physica B. Another successful collaboration is with France, in the form of a so-called "filière francophone" where students are being given some lectures in French. They manage quite well and we hope that this will help in developing further the cooperation between Vietnam and France. I should also mention excellent relations, in both research and training, with the Bangladesh University of science and technology, Chungbuk National University (Korea), the Catholic University in Louvain (Belgium), the University of Bordeaux (France), the University of Minnesota (USA), the Japan Institute of Advanced Studies in science and technology, the Research Institute for physics and chemistry (Japan) and the University of Osaka (Japan). At the

national level we maintain close relations with the Vietnam Academy of Sciences, the Institute of Nuclear Science and Technology and with many other universities and institutes, in particular with the Hanoi University of Technology.

VATLY: Professor, what is the ratio between graduations and in-flow? And what is your assessment of the quality of the training, its strengths and weaknesses?

Prof CONG: On average, 95% of the students graduate. Each year, 60 to 70% of the students pass their exams successfully in June. The rest have a second chance in August and, if they fail a second time, they have to double the year. Students having graduated in physics have good bases in basic science. In most cases they have been taught about the most recent developments of contemporary physics. Many of our students pursue studies abroad after graduation, sometimes in famous universities, and often do well.

VATLY: Could you tell us about your work as Head of the Faculty? Are you satisfied with the system, the assessment of student's abilities, the rigid separation between different classes in the fourth year? What is the reason for having a system somewhat different from what exists in most foreign countries? Is it well matched to the needs of the students, is it easy for them to find a job after graduation?

Prof CONG: The division of the fourth year students into separate classes is a result of inertia: it is a remnant of the structure that was adopted about forty years ago. At that time the cursus extended over five years but, when it was reduced to four, the structure has not been changed much. The specializations are more or less the same as they were, but the time to study them has been reduced. In practice, it is the responsibility of each department to define which part of the programme is compulsory

and which part is optional. We are currently considering how to improve the situation and how to have a better match to the real needs. A recent survey has shown that there are 30 students a year, out of 80 or so, choosing to specialize in electronic engineering. This is to be compared with typically 10 to 15 in the other departments, and just a few in physics of the earth. This simply shows that it is easier to find a job when having graduated in electronic engineering than in other fields, a simple consequence of the demands of the market. Other fields where it is relatively easy to find a job are condensed matter and photonics. Nuclear Physics is where it is the most difficult. But, of course, good students find it always easy to get a job, isn't it?

VATLY: You mentioned the demands of the market, is that the reason for the absence of particle physics and astrophysics departments?

Prof CONG: No, we do not wish to match too tightly our training to the demands of the market. Indeed, we do want to create an astrophysics department. Astrophysics has not been taught in Vietnam yet, only astronomy has, and on a small scale. However, job opportunities for astrophysics students are negligible, simply because we have virtually no astrophysics research in Vietnam. There is no teaching of astrophysics in the secondary school either.

VATLY: As you well know, we are particularly interested in the introduction of astrophysics in our University. Could you tell us more about your plans?

Prof CONG: It is a fact that astrophysics and astronomy fascinate many students. We have already submitted higher up in the University a proposal to create an astrophysics department. We need a staff of about ten to do it. This adds to the difficulty, we lack lecturers trained in astrophysics. Apparently, some members of the theory department are familiar with cosmology, we

might ask them to teach astrophysics. We also have some people who have been trained abroad: we are trying to have them come back to Vietnam in order to help us. Astrophysics is really one of our priorities for the future, we hope it will concretize. We shall start by creating a department this year, but it may take until 2008, when the University will move to a new site in Hoa Lac, before having it well run in. This year, we have invited Pierre Darriulat to give lectures on astrophysics to the honour class. As far as getting around the job opportunity problem, our idea is to make no difference between the degrees given to astrophysics students and those given to general physics students.

VATLY: The introduction of astrophysics into the cursus will be very welcome by many students. A last question, a bit more private, is your salary as Head of the physics faculty sufficient for you to survive without doing extra work?

Prof CONG (smiling): This is a very interesting question. I just happen to have received my check for this month from the finance department of the University. You can look at it: my total monthly salary, including responsibility and special allowances, is about 140 USD. With such a salary, in Hanoi, I can just allow for two persons in my family to survive. To answer your question, I would need to have this salary at least doubled to be able to live on it. But I understand that our country is still having many difficulties and that there are still many poor people. I have confidence in the future of our country and I shall always find enough enthusiasm to overcome the difficulties to do the best I can for our people and for the good of physics.

VATLY: Thank you very much, Professor Cong, for having so kindly answered all our questions. It was for us very useful and interesting!

ITIMS

Dong organized for the group a visit of ITIMS, a high tech centre located in the premises of the University where he graduated. He reports about it below.

Having heard of ITIMS (The International Training Institute for Materials Science) as one of the best high tech laboratory in Vietnam, and the only place having a clean room of international standard, several members of the group asked me to organize a visit to the place. As I had spent some time there as a student, it was easy for me to ask Professor Nguyen Duc Chien, the vice director, to show us around. He welcomed us in a sitting room on the third floor, introducing us to the Centre before taking us around the laboratories. The whole group was present, Bac Pierre, Thieu, Diep, Nhung, Thao and I.



Visit at ITIMS with Pr Chien

ITIMS was established in December 1992 by the Ministry of Education and Training (MOET) of Vietnam. The initiative stemmed from a cooperation, which started back in 1975, between two Dutch universities, Amsterdam and Twente, and two Hanoi universities, National and Technology. ITIMS endeavors to undertake research in areas immediately relevant to local needs as well as providing a comprehensive in-house teaching program. ITIMS tries to keep its education and research according to international standards. It implies frequent contacts with the international scientific community through conferences and common research projects. Several foreign visiting professors and a number of foreign students have worked for a short

period at ITIMS. ITIMS has an International Advisory Board (IAB) with scientists from 6 countries: Vietnam, the Netherlands, Sweden, France, India and the United Kingdom. They meet once a year in Hanoi to discuss the main lines of the education and research programs.

At the end of 1997, ITIMS moved into a building of its own in the premises of Hanoi University of Technology where modern laboratories had been set up for efficient training and research as well as for an improved cooperation with the network groups and other national and international institutions. ITIMS enrolls MSc students annually in August. The MSc program lasts two years. It is continuously adapted to the progress of science and technology and to the needs of industries. The research program of ITIMS is carried out by PhD students and by ITIMS staff through contacts with industries and other institutions. The ITIMS' PhD program may be carried in two possible ways. One is under the joint guidance of two supervisors, one from Vietnam and one from abroad; in four years, the students work two years abroad and two years in Vietnam; they graduate either in Vietnam or in the country where they studied. The other is under the guidance of Vietnamese supervisors; such students may also study in a European country or elsewhere; they graduate in Vietnam. ITIMS covers the tuition and research fees for both the MSc and PhD students. All ITIMS' facilities, such as experimental equipment, computers, library, communication and technical workshops, are open to the students.

While visiting around the laboratories, Professor Chien and Bac Pierre discussed about education and international cooperation in Vietnamese institutions, universities and research centers. We visited the clean room, of class 100, meaning 100 particles per cubic meter. It is equipped with a low pressure chemical vapor deposition device, a sputtering cathode device, evaporators, a spinning machine, etc... There are laboratories on magnetic studies, equipped with many measuring devices, and laboratories for composites and ceramics, equipped with grinders, sifters, presses and various devices to measure materials properties.

All these equipments are thoroughly exploited as testified by many publications both in Vietnam and abroad. This success is the result of the efforts of professors, researchers, and post-docs of the Centre. Professor Chien also introduced the future research lines of the Centre, including new topics in materials sciences and particularly nanotechnologies, a very fashionable field these days.

It was a long and very interesting visit. We thanked Professor Chien warmly for having given us so much of his precious time. Thanks to him, we learned about modern technologies that are being studied in Vietnam.

THE VIETNAM SCHOOL OF PHYSICS IN DANANG (VSOP XI)

The whole VATLY group attended the Da Nang school between Christmas and New Year. Diep is reporting below.

This was the second VSOP that I attended. There were many improvements compared to last year and a lot of good memories in my mind. It was a really wonderful time because we could have a chance to completely bury ourselves into a very exciting scientific atmosphere for two weeks.



A few students in front of the VSOP XI lecture hall

VSOP XI was organized in Da Nang, a lovely seaside city in the centre of Vietnam. Master and PhD students attended the school. They were coming from Thailand, China, Laos and, for the majority of them, from Vietnam. Many students had already attended a VSOP in previous year(s), but they were all happy to come

back to Vietnam and to attend this new edition. Worth noting was the presence of a Thai who had been a VSOP student some years ago and who was coming back this time as a lecturer: he gave very good lectures on non-commutative physics.

Many reasons concurred to make the school a success. It had been well prepared, well run, and our hosts in Da Nang had found excellent lodging and lecturing facilities; may be more important was the love, the enthusiasm and the devotion of the lecturers for science, their will to transmit their knowledge to the students, paralleled by a strong desire on the side of the students to learn interesting new physics.

Among the lectures, some were given by very experienced lecturers, others by very young ones, but we enjoyed listening to both. Some lectures were very dense, like those given by Pierre on particle physics and by Gerald Blazey on collider physics. I was very impressed by the lectures given by the young lecturers: Johann See on nanodevices, Richard Taillet on dark matter and Auttakit Chattaraputi on non-communicative physics. I loved particularly the lectures of Johann See, even though it was outside my field: they were one of the most interesting and beautiful lectures I ever heard. He introduced us to the field of few electron devices using very clear words and calculations easy to understand; moreover, his lectures were in direct contact with a technology that is applied to many devices of current use.

The success of the school owes much to the dedication of the organizers, Patrick and Ky. Patrick, a French professor, has been giving much of his time, for now many years, to the Rencontres du Vietnam and the organization of the VSOP's. He has a close contact with the students, talking to them, asking them about the lectures, making up his mind on points that might be improved in order to increase the quality of the school. He said he was getting old and was sometime tired, yet he attended each lecture and was always prepared to help students; he was making sure that everything was in order; he was trying to find out how the students received the topics being taught in order to take their reaction into account when preparing the next school.

Many said that the Vietnamese students were more relaxed this year than they were in

previous VSOP's: they were asking more questions, were more daring with their English, bravely went to the blackboard to solve problems and gave good mini-seminars. Let's hope they're right, it is not to me to say, but it was indeed a very good training ground for us to have a chance to practice at giving talks.

We did not spend all the time working. A Sunday was devoted to a visit of Hoi An, now a charming and quiet old town but formerly, between the XVIth and XVIIIth centuries, a rich and busy harbor; and of My Son, the site of several beautiful Cham towers, some of which are over a millennium old, remnants of the Champa kingdom that ruled the southern part of Vietnam between the IInd and XVth centuries. New Year's Eve was celebrated in a boat that cruised on the river while we were having a splendid buffet dinner offered by Da Nang's university.



In the lecture room waiting for the lecturer

A sign of the success of the school is how much it had been appreciated by the students. This year, one of Thai students reached Vietnam by bus across Laos, he was a pioneer on this route that is much shorter than the standard one... and much cheaper than flying. The Thai's say they will travel this way next time, so more students can join the school. In the same vein, two Chinese students came by train, a very long journey indeed! We enjoyed meeting many Vietnamese students from other provinces, being together at a same place, having time to speak to each other about our work, sharing our experiences and the difficulties that we may meet. I hope that we will keep in contact to better understand, and possibly help, each other: having

close links should help strengthening the physics community in the country.

Thank you to all those who contributed to make this school a success: our Da Nang hosts, the organizers, the lecturers and our fellow students.

APPC9

Thao reports about the Asian Pacific Physics Conference that took place in Hanoi in October last year and which the whole group attended.

The 9th Asia Pacific Physics Conference (APPC9) took place in Hanoi from 25th to 31st October 2004. It was held in the conference hall of the Ho Chi Minh museum, near the mythic Ba Dinh square where President Ho Chi Minh declared Vietnam independent on September 2nd 1945. It was the first time that an APPC was held in Vietnam. It was organized jointly by the Association of Asia Pacific Physical Societies (AAPPS), the Vietnam Ministry of Science and Technology (MOST), the Vietnamese Academy of Science and Technology (VAST), and the Vietnam Physical Society (VPS). For many young Vietnamese physicists it was the first important conference.

APP Conferences have been organized on a three year cycle for nearly thirty years. They aim at bringing together physicists of the Asian and Pacific (meaning Australia and New Zealand) countries, at having them present their latest research work, at giving them an opportunity to meet and to exchange information and at boosting scientific cooperation among them. The Hanoi conference gathered 700 participants from 28 countries, including many leading scientists of international renown. Japan sent 90 physicists to the Conference, following Vietnam of which there were 425 participants. The latter included many undergraduate and graduate students as well as postgraduates coming from universities and institutes from all over the country. Hundred women physicists took part in the Conference and special attention was given to the specific problems that they may meet in their work by having a round table discussion organized on the subject.

There were separate sessions in theory and experiment for the main branches of physics: particle, nuclear, condensed matter, atomic,

molecular and photonic, statistical as well as special sessions for astronomy and cosmology, biology and applied physics. There were 350 reports and posters presented and two round table discussions on “Physics for development” and “Women in physics”. There were both invited plenary talks and parallel sessions on ten different topics.



At the ethnology museum (five minutes walk from the lab). Left to right: Diep, Pr Fujita, Thao and Nhung.

We very much enjoyed the Conference; it was for us, who rarely have a chance to take part in an international conference, an excellent opportunity to meet other young physicists, to create new links, to exchange information and to learn from each other experiences. More generally, it gave an opportunity to Vietnamese scientists to hear from the best physicists of the Asian and Pacific countries the latest results of today's research. It was also a chance for our authorities to get a general view of the development of physics in the world. They may this way be inclined to give a better attention to some fields, such as astrophysics, that have been insufficiently developed in our country. For us, young physics students, such a conference made us feel that physics deserves being loved and helps us in having clearer views concerning our future research work.

Most of the Vietnamese contributions were in condensed matter physics and material sciences, a few in applied physics. In other fields, they were usually limited to theory, partly a result of the lack of large equipment and modern instrumentation in the country. Diep had a chance to present our atmospheric muon work in

a parallel session that was very well attended, many participants being curious to learn what is being done in Vietnam in this field. Pierre and Khoa were invited to give plenary talks on cosmic rays and nuclear structure respectively, both of which were very well received. Thuan organized a visit of the Institute in which forty or so physicists took part. It gave VATLY a chance to make itself better known in several Asian countries.

The program of the Conference was very dense: we were always happy to hear the reports on “coffee and tea break” that were regularly scheduled... A little bit of rest was welcome and was an opportunity to make friends and chat with people. In particular, we spent time with Shin’ya Sawada from KEK, and Yoshitaka Fujita from Osaka, who both love Vietnam very much. Fujita had been invited by Thuan a few days in advance of the Conference and had given two seminars at the Institute on his ion physics work. Sawada had initiated the donation of scientific books and journals that made it possible to create our library. He is interested in Vietnamese traditional culture and we helped him having an “ao dai”

(the traditional Vietnamese tunic) made for his wife. Fujita loved spending his evenings walking across the Hanoi street, watching the city’s night life, he was proud of having walked more than ten times around the Sword Lake in less than ten days. When visiting the Temple of Literature and Tran Vu, he explained us several ancient Chinese characters that we did not know before. He spent also hours sweating in the library to look for books and journals that we are missing and that he might be able to send us. Both Sawada and Fujita impressed us by their dedication to science and by their wish to help young students in their progress. We also enjoyed listening to Hiroshi Tsunemi from Osaka who gave a splendid talk on X-ray astronomy at the Conference and encouraged Vietnam to join this research. We had a chance to talk some more with him when he visited VATLY.

The Conference ended but many nice memories remain that motivate us to study physics and make us love it.

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