# *VATLY NEWSLETTER*

***A very happy and successful New Year to all VATLY friends around the world!***

*CONTENT*

*This seventh issue of the* **VATLY NEWSLETTER** *comes a bit late, a consequence of the absence from Hanoi of three members of the team who are spending the end of year abroad : Dong and Thao at the Institut de Physique Nucléaire in Orsay and Diep in Malargüe at the Pierre Auger Observatory (PAO). It starts with the usual report on the* **LIFE OF THE LABORATORY**, *goes on with excerpts of* **SPEECHES** *of Pierre on the occasion of some awards and ends with a* **LETTER FROM MALARGÜE,** *an interim report that Diep kindly mailed to us. A* **PHOTO ALBUM** *concludes the issue.*

## *LIFE OF THE LABORATORY*

*You may remember that we had ended this section on a sad note in Newsletter Nr6: CNRS/IN2P3 discontinuing the direct financial support they had been giving to us, a consequence of new administrative regulations. We start this time the same section on a very happy note: Professor Antonino Zichichi, as soon as he became aware of these difficulties, offered his help as President of the World Federation of Scientists, extending to Vietnam its National Scholarship programme that had already been established in 32 countries. Quoting from his letter, "These scholarships are awarded in order to help conduct scientific research activities in national institutions and institutes, under the supervision of an eminent national or local scientist, by providing partial support for living expenses". We take this opportunity to express to him, once again, our deepest gratitude.*

*Following on Nhung, Diep and Dong defended successfully their master theses in the autumn, obtaining excellent marks. Thao will defend her in spring 2007. Also Kim Thi Phuong and Nguyên Viêt Phuong, the fourth year students who had been working with us on their graduation thesis, graduated with excellent marks. The work of K.T. Phuong on Sagittarius A*, the black hole in the centre of the Milky Way, was in fact a collective effort of the VATLY team and resulted in a beautifully illustrated report, the first graduation thesis in astrophysics at the National University of Science and, most likely, in the whole of Vietnam. N.V. Phuong is now in Caen (France) where he studies nuclear physics in relation with research at GANIL.*


*Diep presenting his master thesis*


*Dong's master thesis: Thuan, Nhung, Dong, Pierre, Thao and Diep*

*The upgrade of the main Cherenkov counter on the roof of the laboratory and the running-in of the three smaller counters used to trigger on extensive air showers are now completed (it was the main part of Dong's thesis).*


*Thao in front of one of the three new Cherenkov tanks on the roof of VATLY*

*Data collected with a large scintillator resting on the bottom plate of the main tank are being analyzed by Thao and will be included in her master thesis. The main counter was then filled with clean water, an operation that took over two months because of the low flux of our new filtering system. Particles having a size in excess of 1μm (instead of 10 previously) will now be filtered out and the water transparency will improve significantly. We recall that the other main upgrading actions were replacing the old 8" EMI photomultiplier tubes (PMT) with new 9" Photonis tubes and coating the walls of the tank with aluminized Mylar.*

*Dong coating the wall of the large tank with aluminized mylar*

*Early next year, around Tet, we shall resume data taking to study the improved response of the upgraded counter to muons and to extensive air showers.*

*Nhung has been helping Pierre with his astrophysics lectures at the University by delivering three lectures in Vietnamese on experimental methods in astrophysics, taking Sgr A* as an example. These were very successful. She now started working seriously on her PhD. The administrative difficulties that were met in Vietnam concerning the cotutelle (joint supervision) have been overcome and an agreement has been signed to this effect between Paris VI (Jussieu) and the National University of Science (Hanoi).*

*We recall that the amplified anode and dynode signals of each of the three PMTs that equip the water Cherenkov tanks of the PAO surface detector are read out in FADCs with time bins of 25 ns and ADC counts of 2% of a VEM (Vertical Equivalent Muon). The FADC traces show a complex time structure that results from a superposition of several signals arriving at slightly different times, mostly due to electrons, photons and muons. The excellent optical quality of the Cherenkov counters allows for a large number of diffusions, making a typical individual signal extend over 100 or so ns. The disentangling of such signals from the FADC traces, and the identification of their origin are major tasks of the analysis of the surface detector data which Nhung is addressing. Our contribution to this topic has focused on a number of specific problems: a measurement of the photoelectron to VEM ratio from the observation of the leading edge of the single photoelectron peak; a measurement of the baseline shift following the collection of a large charge and a parameterization allowing to correct for it; an evaluation of the uncertainty attached to the charge collected in each of the FADC bins allowing for quantitative comparisons between the information collected by each of the three PMTs; an evaluation of the asymmetry of the light collected by each of the three PMTs in the early fraction of a signal and its correlation with the zenith angle and azimuth of the shower axis (so-called direct light); the identification of a small – and in practice negligible – after-pulsing component. All of these were known to the PAO collaboration but, in each of these domains, we have been able to contribute new and significant information.The outstanding quality of the detector*

*hardware makes the PAO surface detector data particularly rich. The ultimate aim is to unveil all the information which they contain in order to help, as much as possible, the reduction of the FADC traces into a number of individual signals, each identified as being due to a muon or to an electron or photon.*

*Dong and Diep had been busy with the writing of their master theses until shortly before their leaving Hanoi for Paris and Malargue respectively. Early next year they will also start working for their PhD on topics that will follow on what they are currently doing during their stay abroad: Dong on hardware aspects of the PAO Cherenkov counter and Diep on the PAO fluorescence detector. Diep will also work on shower simulation, in the same didactic spirit as was done earlier for the fluorescence detector.*

*A fourth year student, Doan Thi The, this time from the University of Education, will join VATLY for her graduation thesis work, spending three months with us.*

*A master student, Duong Quoc Van, from the same university, will also join and make his master thesis with us. He will work on setting up two radio antennas that were given as a gift by Pr Nguyen Quang Rieu (from the Meudon Observatory in Paris), in a first phase at the laboratory and, later on, out of town in a place where the electromagnetic pollution is not too important.*

*Recently, we received the visit of a young postdoc who studied astrophysics in Paris and made his PhD thesis on the atmosphere of Mars. He just came back to Vietnam and is of course interested in continuing his collaboration with his former team (they study the atmosphere of Titan and Venus, the latter using a recently launched satellite orbiting the planet). He expressed interest in being associated with us, which, of course, we very much welcome.*

*In August this year, a Rencontre du Vietnam Conference took place in Hanoi. It consisted in fact of two parallel conferences held in the same building, one "Challenges in particle astrophysics", the other on "Nanophysics: from fundamentals to applications". Diep gave a presentation of our progress that has been well received and a visit of the laboratory was organized. This was, as usual, an opportunity for us to update our knowledge of the field and to meet friends. In particular we had a chance to spend time with Jim Cronin who came to Hanoi a few days in advance: he gave a general public conference downtown that was attended by many young students, after what he was invited to the Ministry of Science and Technology where he was awarded a medal in recognition of his support to Vietnamese science. He spent a morning in the lab, discussing with us various items related to the Pierre Auger Observatory, its progress, the recent achievements, the perspectives, the contribution that VATLY can bring, etc... These were very useful and inspiring exchanges which we enjoyed and from which we learned a lot. But his stay with us was also the occasion of leisure activities, such as visits to the Museum of ethnography, to the Ho Chi Minh Museum, to Van Mieu (the Temple of Literature, the first university in Vietnam, nearly one century earlier than European universities) an evening in Diep's place... and a day trip to the Ha Long Bay where Antonio Insolia, who had come to attend the Conference, joined us.*

*Jim Beatty, Dong, Jim Cronin and Diep on the roof of VATLY*

*Following the Conference, thanks to an initiative of Tran Thanh Van, a one-week school on astrophysics was organized in the premises of the University of Education.*

*Two prestigious astrophysicists were invited to give lectures, Ludwik Celnikier on "Cosmic structures for pedestrians" and Grant Mathews on "An introduction to cosmology, dark matter and dark energy". Pierre also gave introductory lectures on the methods of modern astrophysics, taking the beautiful story of Sagittarius A* as an example. This school was a success and gave us an opportunity to make new friends and create new links, not only with Ludwik*

*and Grant but also with the University of Education where an astronomy club, equipped with a 40 cm telescope, is installed (mostly aimed at high school and young university students). A young post doc, Nguyên Quynh Lan, who made her PhD thesis in quantum field theory, is now working there making calculations on possible dark matter candidates and is showing interest in astrophysics.*

*From right to left: Ludwik, Quynh Lan, Ludwik's wife, Quynh Lan's relatives and Grant.*

*The Conference was also an occasion for François Le Diberder, responsible for particle physics at the French CNRS/IN2P3, to meet various Vietnamese officials and physicists and expose his views concerning a possible collaboration on LHC implying also CERN (from which John Ellis was present and took part in the discussions). The idea is to take advantage of the existence of several Vietnamese PhD students and/or postdocs who study in France to start an activity in Vietnam in relation with particle physics at LHC. Nguyên Mau Chung, a member of the CMS Collaboration who studied in Lausanne and is now teaching at the National University of Science, and Nguyên Mong Giao, from Ho Chi Minh City, who has contacts with D0 at Fermilab, were also present and expressed interest.*

*At the end of the summer, Pierre, on behalf of VATLY, was awarded two medals, one by the Minister of Science and Technology and the other by the Vietnamese Physical Society. Excerpts of the speeches which he pronounced on this occasion are reproduced below.*

*In early September a school was organized by Khoa at the Institute, on "Isospin aspects of nuclear physics", supported by the European Union Asia-Link program for postgraduate students. It included lectures by Professors Yoshitaka Fujita (Osaka, Japan) on "Isospin symmetry for a deeper understanding of nuclear excitations" and Gianluca Colo (Milan, Italy) on "Isospin aspects in nuclear structure". We attended and enjoyed both of these.*

*In November, a delegation of the Joint Institute for Nuclear Research came from Dubna to Hanoi and visited the lab. This was an opportunity for Alexei Sissakian, who is now at the head of the Institute, and Pierre to recall many old happy memories and wish each other success in their respective – and of very different scales – endeavours.*

*In July, Thuan reached the end of his term as Director of the Institute. He was replaced by Dr Le Van Hong who has been trained as a reactor physicist and who expressed his will to continue his support to VATLY. We should like to take this opportunity to express to Thuan our deep gratitude for the continued and friendly support that he has been giving VATLY throughout his term as Director and to wish Hong a happy and successful term as the new director.*

*Between Christmas and New Year the 13th Vietnam School of Physics will take place in Nha Trang and be attended by the VATLY team: Dong, Thao and Diep will just be coming back from their stay abroad. Pierre Billoir, the supervisor of Nhung's PhD thesis in Paris VI/Jussieu, who had spent time with us in Hanoi earlier this year (see Newsletter Nr 6) will join on this occasion and stay with us till January 10th.*

***Excerpts from speeches by Pierre on the occasion of being awarded medals***

***1) At the Ministry of Science and Technology***

*It is a great honour for me to receive this distinction and I am deeply grateful to those who had the kind attention to award it to me. I should like to start by thanking them from the deepest of my heart. Knowing that one has friends is the strongest support one can dream of.*

*I should like to start by thanking Doctor Vo Van Thuan, the Head of the Institute where our laboratory is installed, for his entire and unconditional support, both material and moral, to our research. These thanks should include his staff and particularly Doctor Dao Tien Khoa who is responsible for fundamental research in the*

*Institute and who follows very closely and friendly our progress.*

*We are spending much effort in creating close links between our laboratory and the University as we are convinced that for research to progress such contacts are essential. In particular we are trying to help the creation of a programme of astrophysics lectures in Vietnamese Universities. It is not always easy but I wish to thank those who give us their full support in this endeavour, I am mainly thinking of the Vice rector, Professor Bui Duy Cam, and of Professor Pham Quoc Hung.*

*Pierre giving his speech at the Ministry*

*The support we are getting from the Ministry of Science and Technology, from the Academy of Sciences and Technology and from the Vietnam Atomic Energy Commission are of course gratefully acknowledged.*

*To the help and support which we receive from Vietnam, I must add those which we receive from abroad from many friends we have around the world. First from the members of the international Auger Collaboration, with which we are associated, and in particular its funding fathers, Professors Jim Cronin and Alan Watson, who do their utmost to help us grow. Jim Cronin will spend the first week of August with us, and you will have an opportunity to meet him at this occasion. But also many other physicists who follow our progress with interest through the Newsletters which we issue regularly and who give us not only moral support but also, in many cases, very valuable material support: I am particularly thinking to the French CNRS, the World Laboratory with Professor Antonino Zichichi, the Rencontres du Vietnam with Professor Tran Thanh Van, the University of Catania, the Asialink programme and the Odon Vallet fellowships.*

*Finally, from the deepest of my heart, I wish to thank my students for their enthusiasm and my wife for her patience.*

*This award is for me the sign that our effort to create a group of fundamental research is welcome at the highest level in the country, something which pleases me enormously. In a country like Vietnam, which is developing so rapidly, one can understand that the priority goes to applied research rather than to fundamental research. However it would be very short-sighted to neglect completely fundamental research, it would mean that one does not understand that the quality of applied research rests on a solid basis of fundamental research, it would mean that one does not understand the importance for the country to support a program of excellence in order to increase the quality of research and of University training. In receiving this award, an award that really goes to the VATLY laboratory at least as much as to me, I hear the clear message that those who are responsible for science policy in the country are well aware of the importance of fundamental research and are willing to give it the support it deserves.*


*At the Ministry: Phuong, Diep, Thuan, Pierre's wife, Pierre, Khoa, Nhung and Dong*

*I do not want to take too much of your time. But, having now spent many years in Vietnam doing my best to help the country and its science, I have of course many ideas and opinions, right or wrong, on what I think could be done to help Vietnam having the laboratories and the Universities that it deserves. It is not the place, nor do I have the time, to present them but I thought that I should take advantage of addressing such a prestigious audience to let you know of one of my*

*strongest wishes. The students whom we are training are bright, they are enthusiastic, they like science, they like their country and they are determined to do their best to help its progress. My wish is that their country will offer them the future which they deserve, will give them the responsibilities that they are able to assume, will not deceive their enthusiasm and motivation and will prevent them from adding to the catastrophic brain drain that Vietnam has been enduring for so many years. If the efforts which we are making could not concretize in such a way, they would be lost for Vietnam, if not for science, and I would then consider that I have failed.*

***2) At the Vietnamese Physics Society***

*It is a great honour for me personally to receive this medal, and I should like to express my gratitude to Professor Khoi on behalf of the Vietnam Physics Society and the Vietnam Union of Science and Technology. But, more importantly, it is for all of us in VATLY evidence that we have friends in Vietnam who have confidence in us, who trust us and who encourage us to continue. Such a testimony of confidence is an invaluable asset to help us fight our way against all the difficulties and obstacles that we invariably meet in this kind of enterprise.*

*What we are trying to do is to create and establish in Vietnam a team of experimental astrophysicists having an international stature and being able to have its place within the international collaboration of a prestigious experiment conducted at the Pierre Auger Observatory in Argentina and aiming at solving the puzzle of the so-called ultra high energy cosmic rays that reach up to $10^{20}$eV. It is a challenge in many respects.*

*First, and most importantly, it implies establishing a nucleus of four or so talented and knowledgeable physicists at PhD level who can guarantee the stability and the continuity of the team. Only then does it become possible to have incoming and outgoing fluxes of students joining us to be trained in research and leaving us after having obtained their degree. This implies, among other, establishing proper working conditions and offering reasonable wages.*

*Second, we have to overcome the prejudice which is present in many developing countries against experimental physics that is often considered as a lower level activity compared to theoretical physics. We all know that physics is made of both, that they complement each other, that they feed each other, that a good theorist must understand experiments and know about them before trying to explain them, as a good experimenter must understand theory to guide his research.*

*Third, we must overcome another prejudice, which I have often met, that Vietnam does not need astrophysics. Clearly, astrophysics, and fundamental research in general, cannot be a strong priority in Vietnam where the emphasis toward applied physics is a necessity. However, we all know that there is no good applied research in a country that neglects fundamental research and that the main criterion to be applied in fundamental research is simply excellence. From that point of view, astrophysics is in a particularly privileged situation. In the past few years the sum of knowledge we have of the Universe has simply exploded, revealing at the same time an even larger sum of ignorance. [...]*

*A similar prejudice concerns the possibility for Vietnam to engage into research in so-called big science. We all know that this is not a problem and VATLY is proving it. We have the same immediate access to the Auger data as our colleagues in Chicago, Karlsruhe, Paris or Rome. Astrophysics is made today in very expensive laboratories either in space or in huge ground installations. The data are not analyzed in situ but in the universities of the teams collaborating on the experiments being made there. There is no bad physics for the poor countries and good physics for the rich countries: we all have access to the data. As I often like to put it, the sky belongs to all of us; we are all made of the same star dust.*

*Fourth, the fact that modern astrophysics is not being taught in Vietnam is a further important difficulty. [...] Let us hope that the Universities of Vietnam will soon become aware of such needs and that the changes that are necessary to give the country the Universities which it deserves will soon be accomplished. Just to mention an example, let me quote the question of giving PhD degrees under joint supervision of a Vietnamese University and a foreign University, what is referred to as cotutelle in French. It is an opportunity that is obviously excellent for Vietnam, strengthening links with prestigious foreign Universities, giving a guarantee of quality and of honesty, etc. Yet, while the necessary procedure took less than a month in France and Italy, it is still unclear whether it can*

*be applied to Vietnam after many months of discussion.*

*Fortunately, in order to overcome these difficulties, we have many friends abroad who are helping us, in particular the members of the Pierre Auger Observatory, with particular mention to their funding fathers, Jim Cronin and Alan Watson, who both have visited Vietnam on several occasions. But also many other scientists, including organizations such as the French CNRS, the World Laboratory, the Rencontres du Vietnam, CERN, Riken and many others. In Vietnam also we get invaluable support from the Institute where VATLY is installed, the Institute for Nuclear Science and Technology, and in particular from Doctors Vo Van Thuan and Dao Tien Khoa who do their utmost, and even more, to ensure VATLY with good working conditions. We get very strong support, both material and moral, from the Vietnam Academy of Sciences, the Ministry of Science and Technology and the Vietnam Atomic Energy Commission. Finally Vice Rector Bui Duy Cam is giving us unconditional moral support and helping us efficiently to overcome the obstacles that we have to face in the University. I am pleased here, on behalf of VATLY, to express to all of them our deepest gratitude. I personally wish to extend these thanks to all my colleagues in the Institute and particularly to those in VATLY.*

*Thank you again for this token of confidence and for the encouragement it implies. I can ensure you that together with the VATLY members we shall continue to do our utmost to serve as well as we can the interests of Science and the interests of Vietnam.*

## *A LETTER FROM MALARGÜE (dated December 20th 2006)*

Thanks to the financial support of the Vietnamese Ministry of Science and Technology and the Asia-Europe link program, I came to Malargüe (Mendoza, Argentina), where the central campus of the Pierre Auger Observatory (PAO) is located, one and a half month ago. It already gave me the opportunity of many first experiences: – joining a big collaboration's meeting and getting embedded into its particular atmosphere, – operating the detector in its data taking mode, – going to the pampas in order to access detectors that had to be repaired or maintained – and meeting a lot of nice and kind people, both collaboration members and Malargüe residents. I am learning a lot from this journey and I have been impressed by the many things I have seen.

The main purposes of my journey were to attend the Collaboration meeting and to take shifts during the run at the fluorescence detector (FD). The FD is one of the two main detectors of the PAO, that on which I am going to work for my PhD thesis together with the PAO group of University of Catania. These shifts were expected to give me a much deeper and more detailed knowledge of it.

The Collaboration meeting came first, in the week from the 13th to 18th of November in a nice Conference Centre in front of the campus. The meeting's atmosphere was quite tense, yet a bit more relaxed in comparison with that of an international conference. I have been assaulted by a host of information. Most of it scientific of course – unfortunately I missed the presentation by Pierre Billoir that was scheduled on the first day and where he reported about the work of Nhung, but I heard that it had been well received. I could not digest it all, but I learned a lot about what is going on and it will now be easier for me to know where to search for information. But also a lot of other discussions on topics such as: – the publication policy, – how to improve communication between the members of the collaboration – how to work more efficiently and be more productive – what should be required from new groups joining the Collaboration – planning the outreach programme, – organizing and sharing the work that needs to be done, and all kinds of other problems which the Collaboration has to face...

*Inauguration of the Loma-Amarilla FD station. Jim Cronin is standing in the centre.*

The meeting was for me an opportunity to meet many scientists and VATLY friends such as Jim Cronin, Giorgio Matthiae, Rosanna Cester, Paul Sommers, Antonio Insolia, Tiina Suomijärvi, Pierre Billoir, Greg Snow, Bruce Dawson... They were very happy to see a VATLY member in Malargüe and expressed their encouragements to the team to contribute more and more to the work of the Collaboration.

*Diep and Antonio Insolia at the Loma-Amarilla station*

The work in the pampas was a really nice experience. I went to the field several times: to help with the maintenance of the surface detectors, to launch balloons for the atmosphere monitoring measurements and to help a Dutch group with some radio work. I learned the beauty of the pampas and, at the same time, the difficulty to work there. The first time I went in the field, together with two engineers from the campus, it was to fix some dead surface detectors: the central data acquisition system was receiving no signal from them. It turned out to be really tough to reach the first detector: it was located in a remote area and the roads were difficult to drive onto. Once having found it, we had to work in the sun, with a strong wind that was lifting lots of dust in the air. We fixed the first tank and drove to the next, that was far away; but after having driven quite a distance, we got a phone call that the first tank was faulty again... so we had to drive back to it and, this time, fix it for good. When reaching the second tank, we realized that the radiator of the car had been leaking and was dry. So, two of us had to go to look around for water. But we felt as being in a real desert: I thought we would never be able to find the least drop of it in these dry fields. But my partner was experienced and knew that we had to follow a particular species of grass: after a long walk, we finally found some.

*Trying to fix the leaky car in front of the faulty tank.*

Yet, it was not enough to get the car started again and we had to call for help from the campus to tow us back home. It was not an easy task; it took our rescuers a long time to find us. Such was my first experience in the field... I was quite tired at the end of the day, but I'll never forget it.

Presently, I am taking shifts during this month's moonless run. I was very eager of it as I heard so many stories about big accelerator experiments running around the clock and physicists taking continuous care of the detector: I was impatient to have this experience as a physicist; I enjoy particularly the feeling of responsibility that it gives.

*FD shift: Oana, Javier and Diep*

We have to spend the whole night operating the FD, it is a very useful experience. I now know every step required for the FD to work and the many kinds of data it records. It is also a good opportunity to discuss with my colleagues on shift and exchange knowledge with them.

I have been enjoying many other interesting events. I attended the inauguration of the fourth and last FD site, together with many members of the Collaboration; it was a good opportunity to look at an FD eye... with my own eyes.

I enjoyed the exciting atmosphere of a big parade on Malargüe's day, a really nice experience. It was an opportunity to learn about the town, many local achievements were exposed in an exhibition, people were wearing traditional clothes and gauchos were riding horses... A delegation from the Collaboration had joined in the parade: they were warmly welcome and got a tremendous applause from the spectators.

It has become a tradition to hold a Collaboration meeting on "Malargüe's day" and the physicists enjoy taking part in this exciting event. It ended with a Collaboration dinner – tasting local dishes with delicious meat – with music and dance, another unforgettable experience.

People in Malargüe are very friendly. They treat me well. I spent two weeks in the Bamby Hotel, a family hotel. The owners have been very kind to me, helping me to move my things to my new apartment when I left, inviting me several times to share their meal. This very evening, they have cooked Vietnamese rice for me. After nearly two months on a meat diet, you can't imagine how much I enjoyed it!


*The PAO delegation at Malargüe's day*

Indeed, it is an unforgettable journey, as enjoyable as it is useful. I wish to thank all those whom I met here and contributed to make my stay so pleasant, in particular Paul Mantsch and Gualberto Avila Cadena. But also Rosa Pacheco who found for me a nice flat, and Julio Rodriguez Martino who taught me so much about the FD.

***Distribution:*** *Patrick Aurenche, Jim Beatty, Jean Pierre Bibring, Pierre Billoir, Murat Boratav, Bui Duy Cam, Ludwik Celnikier, Georges Charpak, Nguyen Duc Chien, Bach Thanh Cong, Jim W. Cronin, François Le Diberder, Minh Ha Pham-Delègue, Manoel Dialinas, Luigi Di Lella, John Ellis, Alberto Etchegoyen, Daniel Froidevaux, Yoshitaka Fujita, Karel Gaemers, Bernard Genolini, Nguyên Van Giai, Le Van Hong, Jacques Haïssinski, Nguyen Van Hieu, Morihiro Honda, Pham Quoc Hung, Antonio Insolia, Dao Tien Khoa, Stavros Katsanevas, Marc Lachièze-Rey, Nguyen Quynh Lan, Grant Mathews, Peter Mazur, Etienne Parizot, Michel Pedoussaut, Eliane Perret, Denis Perret-Gallix, Bernard Peyaud, Joël Pouthas, Philippe Quentin, Burton Richter, Nguyen Quang Rieu, Jean-Michel Rieubland, Jonathan L.Rosner, Shin'ya Sawada, Dieter Schlatter, Greg Snow, Paul Sommers, Michel Spiro, Jack Steinberger, Annick Suzor-Weiner, Tiina Suomijarvi, Christine Sutton, Marilena Streit-Bianchi, Tran Minh Tam, Dick Taylor, Samuel C.C. Ting, Hiroshi Tsunemi, Hoang Tuy, Odon Vallet, Jean Tran Thanh Van, Suzy Vascotto, Sylvie Vauclair, Tini Veltman, Alan Watson, Achim W. Weidemann, Atsushi Yoshida, Antonino Zichichi.*

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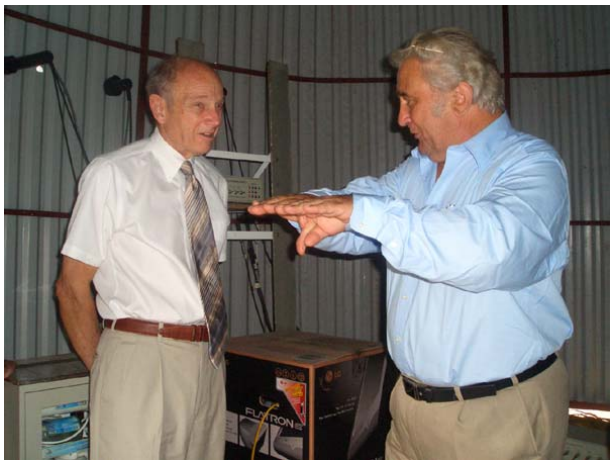
*Issues 1 to 6 of VATLY's Newsletter are available from our web site*
*http://www.inst.gov.vn/inst/English/About/VATLY/Vatly.htm*

## *- PHOTO ALBUM -*

*In the Ethnology Museum: Dong, Thao, Diep, Jim Beatty, Jim Cronin and Nhung*



*Jim and Pierre on the roof of VATLY*

*On the boat in Ha Long Bay with Jim Cronin*

*Pierre and Jim on the boat trip in Ha Long Bay*

*Dinner in Diep's place: Jim, Dong and Phuong, Thao, Diep and Dung*

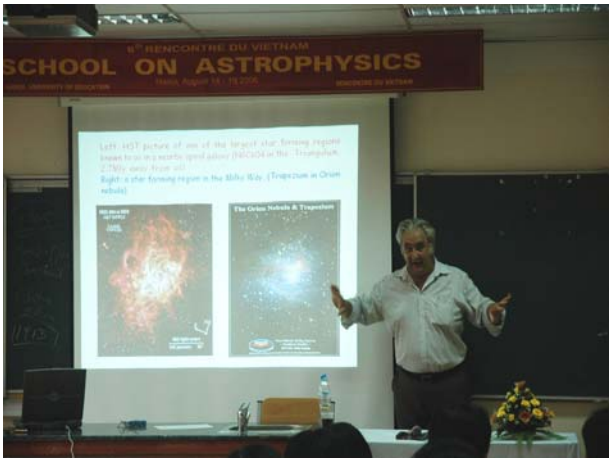

*Closing the tank: Dong, Phuong, Diep and Nhung*

*Diep inside the Cherenkov tank*


*Viet Phuong presenting his graduation work*


*After Diep's master thesis: Thuan, Khang, Thiep, Diep, Diep's wife, Pierre's wife, Pierre, Hung, Khiem and Khoa*

*A student, Ludwik and Van at the astrophysics school*




*Pierre teaching*

*Ludwik*

*Grant Mathews singing "Yesterday"*

*Grant with a few students*

*Pierre with young students at the astrophysics school*

*A happy audience at the astrophysics school*

*Boat trip on Ha Long Bay: Pierre, Diep, Thao (nearly hidden), Nhung, Antonio and Jim.*

*Diep after the baloon launch (next to his right ear)*

*Pierre Billoir and Diep in Malargue*

*The Parade on Malargue's Day*