

THE GRAVITATIONAL VOICE

number 4 **APRIL 2007**

LSC The first joint meeting of the LSC and the Virgo Collaboration

- It is a great pleasure for us to embark on the new relationship between the LIGO Scientific Collaboration and Virgo. We'll grow into our relationship, this first joint meeting is
- a start.
- A major item on the agenda, when to invoke the datasharing provisions of our agreement? Today, we'll discuss a proposal to commence data
- sharing on 18 May 2007
- Further discussion and (hopefully) a vote at tonight's meeting of the LSC Council.

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LIGO-VIRGO: **Common Data Taking Becomes a Reality**

NEWS FROM THE SITE From Virgo Commissioning to the First Science Run

LIFE AT THE SITE Do you Speak Virglish?

OUT & ABOUT To Know the Road, Ask those **Coming Back**

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Dear Editor of the Newsletter h,

besides traditional research, performed in libraries and museums, our staff is continuously browsing the web searching for news and information that may be useful in illustrating the figure of Guglielmo Marconi, as inventor, scientist and human being. Of course we are also interested in related subjects, in particular those showing the ingenuity of young researchers, as was Marconi.

We regularly visit the sites of several important laboratories worldwide. We follow your progress on the Virgo web page, reading your pleasant newsletter h and the Virgo Logbook. Of course, we are not able to understand all the subtle technical and scientific details of your work but, recently, we spotted on entry 15506 the clever implementation of a simple magnetometer that allowed the measurement of electromagnetic noise affecting your detector. The improved magnetometer version, shown on logbook entry 15545, seems outstanding to us. The comparison to the early work of Marconi is obvious.

Would it be possible for you or the clever developer to write a note on the magnetometer and on its performance? More importantly, would it be possible for you to donate the magnetometer prototype to our museum (of course when it is no longer in use)?

Dr. April F. Day, Director

Guglielmo Marconi World Heritage Museum

Dear Dr. Day,

I am sure that our "inventor" - we have many of them in our team - will be glad to write the note you requested.

As far as the donation is concerned, we are not in position to dismiss the magnetometer; similar instruments can hardly be found on the market. Anyway we will build a mock-up for your exhibition, including the read-out electronics.

Please let us know if you have a Museum web page to be visited; we would like to insert a link to it in our web page.

Carlo Bradaschia



From Virgo Commissioning to the First Science Run

"A patient work of details, no great revelations"

For those addicted to the orders of magnitude, gaining some ten percent in the sensitivity or just killing a peak in the spectrum can be frustrating. But it was well known that, when approaching the design sensitivity, the noise hunting would become harder and harder.

Along with the obvious geniality needed to do commissioning work, it has also been defined as a "patient work of details..." by a colleague from the team. This was also the experience at LIGO: the last order of magnitude took years. The reader can take a look at the recent seminar by Rana Adikhari (http://www.egogw.it/public/events/seminars/docL ist.aspx?SeminarID=25) which well explains the difficulties encountered, before reaching the design sensitivity, by the American project during the almost 6 years of commissioning effort.

Why is the last order of magnitude so hard? Maybe because of an interferometric Murphy's Law, or more likely because, as the interferometer sensitivity increases, the importance of the smallest effects become enormous.

This is for instance the case of the *environmental noise*, which has been one of the main issues over recent months, and constitutes a large part of the future planned activities.

The noise mechanism can be explained in the following way: when a beam exits from the interferometer, for instance the beam carrying the gravitational wave signal, it hits some optics (lenses, mirrors) and finally it impinges on a photo-detector. During the couple of meters in the air a small fraction of the beam can take another path; it can be reflected by the second face of a mirror, diffused by the edge of a lens, or simply reflected back by the surface of the photo-detector. If this light, which is *contaminated* by seismic and acoustic noise, reenters the interferometer, it can spoil its sensitivity. A millionth of the light transmitted by the interferometer's main output is more than enough to destroy the Virgo performance.

In the last few months we have discovered that the interferometer was limited in a large region of the spectrum by this type of noise, produced by spurious beams at the detection port, the injection port and the terminal benches.

The diffused light mitigation is a good example of a "patient work of details": replacing the most critical mirrors with bigger ones, "reshuffling" the optical tables, improving mirror mounts and turning lenses.



A first mitigation has been performed over the last few weeks, but further optimizations are planned. In April the detection Brewster window will be replaced with a larger one, thus decreasing the amount of scattered light by this element.

Of course, not only the coupling mechanism can be reduced, but also the noise source. So, in April an acoustic isolation of the detection laboratory will be installed, and similar shields are planned for the end optical benches.

Therefore, if you see people with hammers and big loudspeakers inside the central building, don't be scared: they are doing "tapping" tests and acoustic noise injections. In other words, they are enhancing the natural noise (acoustic, seismic) around components like optics, tubes, etc...to identify the critical ones and prepare the *mitigation*.

Along with this activity, the main commissioning achievements during these past few months have been the reduction of the longitudinal control noise and the improvement of the interferometer duty cycle of the detector.

The reduction of feedback noise, dominating the interferometer sensitivity below 200 Hz during the first WSRs, was a masterpiece of control design. It was a cocktail of signal combinations, "neo" elliptic filters, Greek letters (α , β noise subtractions), and other very sophisticated tools, which would be difficult to explain in this short paper. The important thing is that the feedback noise no longer dominates the sensitivity above 50 Hz.

Somebody recently asked me why one of the filters used in the interferometer control was called "neo". The clever reader has probably noticed that this filter's name is not quoted in any control design literature. The name "neo" was in fact invented in the middle of the night, a couple of years ago, during some troubles with the Anderson alignment technique. If you have watched the movie "Matrix" (a commissioning crew classic) you will understand: in order to save the world, Mr. Anderson, an ordinary man, should enter into the matrix and become the hero "Neo".

Following the noise budget estimated for WSR9, the interferometer sensitivity is now limited by photon counting (shot) noise above ~400 Hz. Below this frequency the spectrum is not completely understood, being 2-3 times above the sum of the known noise sources. We believe that it's mainly due to the environmental disturbances, discussed above.

During the first weekend science runs the duty cycle was limited by bad weather conditions. Someone will remember the outstanding "weather formula", giving the coalescing star inspiral detectability range (or horizon) in terms of wind and sea. An ideal situation for the first GW interferometer built in Malibu by Robert L. Forward: if the interferometer cannot lock, let's go surf! But we are in Cascina, and despite the undeniable charm of this relation between a distance in the universe (in mega parsec) and the meteorology, it was quite annoying to have a substantial decrease of the Virgo sensitivity and duty cycle during days of bad weather. After considerable work in terms of alignment and mirror suspension controls this relation is no longer valid, and the interferometer is much more stable, as proved by the recent WSRs. During WSR9 the interferometer was locked in science mode for more than 55 hours, and manually unlocked. Quite an impressive improvement from the first lock of the recycled interferometer, in October 2004, which lasted only 40 seconds.

After nine WSRs (the first was during last September) the Collaboration recently decided to start a four month long science run, with the aim of collecting scientific data in parallel with the LIGO and GEO detectors, already running in the LSC-S5 data-taking framework. The beginning of the first Virgo science run (we encourage the Virgo management to find a name before the end of the run) will be on the 18th of May. about four months before the end of LSC-S5.

As shown in the graph in the previous page, Virgo has a competitive sensitivity in the kHz region (mainly interesting for burst sources). We still have a couple of months to gain something in the 100 Hz region, to increase the horizon and to also make the Virgo data more interesting for coalescing binaries inspirals. To this purpose, the schedule of the detector activities is quite tight and for details you can visit the website wwwcascina.virgo.infn.it/collmeet ings/DMwebpages/Spring2007Pla nning.zip (if you want to plot it, use the A0 format!).

After the science run, a second commissioning period will follow, the duration of which is still to be decided, according to the commissioning progress and the observational results.

At the same time the preparation work for the next steps is on going, and in April the first review of Virgo+ will be held. For that we believe it is very important that all the lessons given by these years of experimental work will be used.

Coming back to the definition given at the beginning of this paper, the complete sentence was: "a patient work of details... not great revelations". Maybe the revelations will come during the science run, who knows...

M. BARSUGLIA

Extraordinary EGO Council Meeting

The main points discussed were: By approving the minutes of the 15th Council meeting the start of the 2nd EGO R&D program was in practice confirmed; proposing agreements with the laboratories that had proposed the approved projects.

The Director presented to the Council an update of the situation at EGO after the few weeks since the last meeting in December. underlining the foreseen changes in the salary scale and the application for the starting year of the advancement model for the staff. On the financial side the Director informed the Council of the closure of the 2006 budget and start of the 2007 one with deferment from 2006 to 2007 of some Virgo upgrade expenses compensated by anticipation from 2007 to 2006 of some expenditures for infrastructures and for computing.

The EGO Council, taking into account the fact that 5 years have passed since the EGO consortium started its operations and 3 years since the beginning of the commissioning of the Virgo antenna, decided to appoint a visiting committee to review the EGO and Virgo managerial structures as well as their interrelationships in order to identify eventual improvements that need to be implemented. The committee is composed of 6 members:

Sergio Bertolucci - Vice-President of INFN

Fabienne Casoli - Director of Institut d'Astrophysique Spatiale à Orsay Giovanni Fiorentini - Director of the INFN Section of Ferrara

Guy Guyot - Planck Project Manager and Charge de Mission for Technical Infrastructure of INSU/CNRS

■ Yves Petroff - French national representative in ESFRI, Chairman of the committee

■ Piergiorgio Picozza - Director of the INFN Section of Roma 'Tor Vergata'.

The committee started its mission on the 25th of February 2007 and is expected to deliver its recommendations by the 31st of May. They met for the first time on March 15, at the EGO site, where

the EGO Director and Virgo representatives discussed the present situation.

In relation to the MoU VIRGO-LIGO the Council nominated the VIRGO member of the "Liaison Group", in the person of Adalberto Giazotto. The Liaison Group,

made up of two advisors, one appointed by the LIGO Executive Director and the other by the EGO Council, shall monitor the functioning of the MoU and of its addenda.

The Council decided, after some consultation with NIKHEF, to propose, instead of a long-term agreement, a one-year Convention between EGO and NIKHEF renewable for two more years to regulate the relationship between the two bodies. It is now expected that the Convention will start in March 2007.

F. MENZINGER

Jumps Back in Action

Sensitive new seismometers placed at the north and west ends of Virgo have revealed an unexpected source of seismic noise affecting the interferometer. At first, the collected data left the Commissioning Team completely perplexed as to exactly what was causing this low frequency event, obeying Poisson statistics. However, closer inspection, and a little luck, have revealed that the source of the problem is in fact to be found in the drainage channels running alongside the fields situated around the site.



Much investigation led to early theories based on magnetic noise, mirror heating and spurious beams, as the effect, although not sufficient to cause the opening of the Super Attenuator local controls, proved enough to affect the signal on the dark fringe and, in extreme cases, cause the interferometer to unlock.

For a long time the problem appeared unsolvable and it was only thanks to the VIRGO-LIGO collaboration that an answer was found. During his visit to the Cascina site, at the beginning of March, Rana Adhikari was able to draw on his experience at LIGO and quickly identify the problem. Having examined the available data and noted the similarities with a similar trend at the Hanford site, it was possible to determine that the real culprit was in fact the local frog population.

The problem occurs when one of the four-legged amphibians leaps forward and croaks at the same time. Further investigation has shown that this strange phenomenon is actually the fault of the local male frog population. The female croak is not a problem - this is the noise that we are able to hear throughout the long summer nights on the site - it is the low frequency croak of the male of the species that is causing difficulties.

A task force has been set up to examine ways to overcome the problem and no options have as yet been ruled out, from regular draining of the channels to setting up dummy-frogs around the site to encourage the real thing to move further afield. The most likely solution to be adopted is the currently under development 'Joint Unexpected Motion Prevention' system for the Inverted Pendulums, that would likely be included in the automatic locking procedure as ALP JUMP 13.

> COMMISSIONING TEAM PHOTO: H

Site Visits and Public Outreach

Site Visits

Also in the present school year, the EGO site visits, by both classes and associations, have been running at full steam, thanks to a small group of volunteers: Christian Corda, Irene Fiori, Franco Frasconi, Federico Paoletti and CB; Severine Perus takes care of managing booking requests. Almost every Saturday morning we have groups of up to 50 visitors, received and accompanied around the lab in a two hour long visit and seminar.

The visit program is organized in collaboration with "La Limonaia", a cultural association very active in the dissemination of scientific culture (http://www.lalimonaia. pisa.it/) and with the Comune di Cascina, that provides a shuttle bus service from downtown Cascina to the EGO site.



Among the usual visits, one in particular is worth mentioning that by a class of the College Segurane of Nice, last February 9th: it was the first high school class visiting Virgo to come from France. The visit was organized and accompanied by Mme Jacqueline Feillet, English teacher at College Segurane.

We sincerely hope that our French colleagues stimulate other classes to follow this open track; even if the journey is longer from France, Pisa (+ Virgo) vaut bien un voyage. The relevance of this visit was enhanced by the participation of the Conseiller Generale des Alpes Maritimes, Mr. Marc Concas, who was welcomed by a delegation from Cascina County Council, formed by the Assessore, Mr. Roberto Lorenzi and by Dr. Giulio Vannucci.

As many other laboratories do, also EGO had, on Saturday March 24, its third "Open doors at EGO" Day, organized in the framework of the XVII Settimana della Cultura Scientifica (March 18-25, 2007, http://www.miur.it/ 0003Ricerc/0144Diffus/index_cf3. htm, http://brunelleschi.imss.fi.it/ info/settcult2007/). On this occasion three guided tours were organized (9:00, 11:00, 14:30), devoted to single visitors and not only to organized groups, upon reservation.

Ludoteca Scientifica

Literally translated as "Scientific Playroom", it is an interactive exhibition for schools and the public, which will take place, for the fifth year, between April 14 and May 20, in Pisa, at the Vecchi Macelli exposition area.

The Ludoteca Scientifica strictly follows the approach of Galileo Galilei: "E' sciocchezza cercar filosofia che ci mostri la verità di un effetto meglio che l'esperienza e gli occhi nostri" ("It is nonsense to search for a philosophy showing us the truth of an effect, when it is better to experience it with our own eyes".

The motto of the Ludoteca could be "forbidden NOT to touch", and it is achieved by creating interactive exhibitions which fire the imagination, by developing educational products, projects and games, and by making programmes such as lectures, demos, workshops and science theatre (http://www. ludotecascientifica.it/index.htm). We warmly invite our readers to pay a visit with their children. Dedicated to EGO (one of the funding institutions) and to Virgo, there is a laboratory space with a series of posters about gravitational waves, their origin and their detection. The highlight of this lab, however, is that, twice a week, small groups of selected high school students, under the guide of a Virgo scientist, build with screwdriver, drill and glue a small interferometer, and experience directly the interference of light. The newly built interferometers are donated to the students, to be brought to the home schools for further experiments and demonstrations. The components for the so-called "€100 interferometers" are provided by the Pisa Physics Department, in the frame of the "Progetto Lauree Scientifiche" (http://www.progettolaureescientif iche.it/cgi-bin/WebObjects/pls). C. BRADASCHIA

VESF School Strikes Back

The 2nd edition of the VESF school on GW will be held from May 28th to June 1st at the EGO site. Although it is named "2nd", the school is not so young. It was born 6 years ago with the name of Virgo-SIGRAV school, then renamed Virgo-EGO-SIGRAV. The VESF took over the organization last year. In 2006 it was a big success: 40 students from 14 different countries attended the school. Their reactions were very positive, sometimes enthusiastic. The level of the lecturing was indeed appreciated, as well as the organization and the general atmosphere.

The program for this year will be a bit different. For the first time it

has been decided no to hold the first traditional "Introduction to general relativity". Since Virgo is entering a new phase, there will be more focus on data analysis lectures. As usual, there will be many lecturers from outside Virgo: Martin Hendry (Univ. Glasgow, LISA), Alicia Sintes (Univ. Mallorca, LSC), Luc Blanchet (IAP Paris), H.Dimmelmeier (MPI Garching), M.Bruni (Univ. Portsmouth), L.Piro (INAF Rome), Bernd Bruegmann (Univ. Jena). Beside the specific GW issues there will be lectures on astrophysics (L.Piro on GRB) and numerical relativity (B.Bruegmann ΒH coalescence and on H.Dimmelmeier on Gravitational collapse). The program and other useful information can be found on the web: www.ego-gw.it/ school2007.

G. LOSURDO, DIRECTOR VESF SCHOOL

+++LATEST NEWS+++

With the improvements achieved last March 28, Virgo has a sensitivity better than any other detector, below 30 Hz:



LIGO-VIRGO Common Data Taking Becomes a Reality

The signature of an important Memorandum of Understanding (MoU) on 18th January 2007 may signal a new way of life for LIGO (intended as the whole LIGO Science Collaboration, including GEO) and VIRGO (written in capitals, to indicate both the Virgo Collaboration and EGO). The full text can be read at https://pub3.egogw.it/codifier/ index.php?content= show&doc=1632.

The most relevant agreement being that LIGO and Virgo will start data taking together, as soon as Virgo has achieved a scientifically significant sensitivity; this is planned (expected) to happen starting from May 18, 2007. From that moment on, all the data collected together will be analyzed coherently as if coming from a single detector, made of several sensors distributed on the two sides of the Atlantic and on the East coast of the Pacific. This will bring to the collected data an improvement in statistical significance and a great increase in confidence.

The relevance of this agreement induced LIGO and VIRGO to release a common press release, available on both web pages (http://pr.caltech.edu/media/Press_ R e l e a s e s / P R 1 2 9 4 8 . h t m 1, http://wwwcascina.virgo.infn.it/Co llOrganization/Press-Release-Feb-2007.htm). The press release triggered a few interviews of Virgo members (Benoit, Adalberto, Carlo) that have been transformed into news published on Nature and on New Scientist (web only).

The first visible effect on our activity will be to have many common collaboration meetings. The first LSC/VIRGO common meeting took place from Saturday 17th March to Thursday 22nd March 2007 (http://www.LIGO.org/ lscconf/lsc07/index.html). The meeting location was in the meeting rooms (the plenary session room being called "Riverview Ballroom A") of the Hilton Capitol Center, a quite huge 10 storey building in pseudo-Byzantine style with completely white painted bricks, in the Baton Rouge (Louisiana-USA) downtown. The hotel has a marvellous view of the Mississippi on one side (and of ruined buildings and multi storey parking lots on the other). Over 80 talks were presented and followed by more than 200 participants, among them 15 people from VIRGO (a little bit wary, so to say). The first two days (Saturday and Sunday) were dedicated to faceto-face talks on data analysis, with the aim to converge on a unanimous proposal to really start the data exchange as soon as possible. On Sunday evening there was also the opportunity to visit the Livingstone site (someone visited it more than once), which was in science mode, and therefore it was not possible to walk around much. Essentially, the visit was restricted to the control room, not too dissimilar to the Virgo one. In particular it was possible to visit the recently established visitor's centre, hosting several very interesting didactical scientific experiences. It is mainly aimed at schools and has been prepared b y the "Exploratorium" of San Francisco. Monday was dedicated to the data analysis groups plenary session (stochastic, binary, burst and CW), Tuesday focussed on LSC, LIGO and S5, experiments status (including Virgo), data sharing and plans for the next 6 months of data analysis, LSC internal updates like NSF report, LIGO roster and publication policy, and presentation of new members.

Even if the meeting has been really important for the people working in Data Analysis, there was also a lot going on for instrumentalists, with interesting reviews of what has been done in the GW experiments and, especially, giving a clear picture of what is going to be done in the near future for the advanced detectors: Enhanced LIGO (more or less the LIGO equivalent of Virgo+), Virgo+, Advanced LIGO and Advanced Virgo. Wednesday and Thursday scheduled more technical topics, starting from a morning plenary session including a report on the Virgo commissioning and Enhanced LIGO, S5 calibration and environmental issues, the 40m Caltech prototype status, squeezing, coatings and the status of the Advanced LIGO laser. The afternoon was divided into parallel technical sessions, including optics/lasers, suspensions, advanced configurations, detector characterization a n d sensing/control. The last session, on Thursday morning, was also divided into technical and workgroup sessions, such as Advanced LIGO, laser, optics and detector characterization. The meeting ended on Thursday afternoon, after the summaries presented by the chairmen and general conclusions and salutations, while the participants, who had survived to the end of the meeting marathon, the cold air blowing from the air conditioning and the noise of the nearby medical meeting, were eating on the meeting room desks from their lunch boxes.

The usual social dinner took place on Wednesday. The exiting Spokesperson, Peter Saulson, was thanked on behalf of the whole collaboration by Dave Reitze, the new LIGO Spokesperson, in a very informal and typically American way: at a point Dave, looking up Prof. Saulson's seminal book on GW research, pointed out that he couldn't find subjects such as signal recycling, thermal compensation, etc, so jokingly suggested to Peter that it was high time for a new edition. In another case, after having greeted Peter as the John Adams (sic) of the LSC, the George Washington (Rai Weiss) was also called to the pulpit, and both received a plate commemorating their successful mandates, and so forth. The social dinner would have been perfect, if only there had been wine or beer on the table, instead of ice tea (with the omnipresent ice cubes in the glass). So people very quickly swarmed away in search of some regular drink.

This is only an example of the good spirit that pervaded the meeting. People in LSC are very confident, S5 (started on 8th November 2005) has been a big success: more than 75% of one year (275 days) of LHO/LLO accumulated coincidence time (the goal is one year of accumulated coincidence as of September 2007), design sensitivity, over 15 Mpc average BNS horizon. Everybody is very happy. Financing of Advanced Ligo is very close, also owing to the fact that in the USA there is an increase of the research budget by almost 9% in the physical sciences, and Advanced Ligo is among the first projects in the list of NSF (for LISA it is another story, since NASA is planning to withdraw from it). The quality of the talks and the participation of the participants were also very high: there is a striking difference in the liveliness of this meeting with respect to the Virgo collaboration meeting: more people, more questions, thorough discussion going into details, with everybody's participation to debate, beautiful talks, a final revision and summary of all the presentations, everything like a regular conference. This is surely due to the consciousness of the success of the experiment and confidence in its future developments. But we also think that the fact that LSC general meetings happen (at least up to now) only four times per year, only two of which are true instrument meetings, surely plays a role: things would probably be different if also in Ligo they had to meet every month like us.

The most important outcome of this meeting, was the decision by the LSC Council, approved with a large majority (46 to 6) on Tuesday night, to implement the provision stated in the MoU of January 2007 for the data sharing with Virgo, starting on 18 May 2007. At the LSC Council meeting on Tuesday the Virgo VSC member were invited, but it had been decided that only Benoit and Raffaele would participate (the Virgo VSC members had joined a meeting of the LSC Executive Committee on Monday night). This decision, to be approved by the Virgo VSC in the very next days, also encourages data exchanges before this date for technical preparation purposes, and urges the joint "Run Planning Committee" to be ready to propose options for organizing the joint running of Ligo, Virgo and Geo over the next years, to be discussed at the next meeting at end of May. This means that, starting from 18th May 2007, the data collected by Virgo, Ligo and Geo will be available to all the members of LSC and Virgo, that all the scientific results will be results of this collaboration, that all the papers containing results coming from the data will be signed by everybody (big job for those who have to write the author list). Everybody working in the field are greeting this decision as a big step forward toward obtaining scientific results from more than a decade of detector work. This resolution apparently was not that obvious. There was considerable resistance. all expressed openly in the discussion of Tuesday 20th

morning: in this session there were more people, all from LSC side, expressing more reservations than being openly in favour of the data sharing. Many maintained that there was no real need, at the end of a successful scientific run, to share data with a detector that could improve sensitivity only for a small number of possible sources, that if Geo had been considered not significant for S5, why should not the same criteria be also applied to Virgo, the further burden of data analysis being heavier than the possible advantage? But at the end the point of view of those who had remarked that there was no reason to be afraid that Ligo could lose something by this collaboration, but rather benefit, in particular for burst and stochastic background searches, has prevailed. We are all sure that this was a wise and farsighted decision.

The LSC-Virgo agreement was not the only one: in particular, the LSC groups have reviewed the search projects for the next few months. These plans start to include Virgo as the 5th detector of the network, and to plan the best use of its data. Virgo is especially expected to contribute in the next months to the high frequency search for burst events, but also in the follow-up of candidates for burst and inspiral analysis. Better upper limits on the stochastic background will also be made by including Virgo data in the future studies.

The Baton Rouge meeting was an interesting and turning point event. The atmosphere that one could breathe there was exciting, the enthusiasm genuine, the discussions effective, the results crucial for the collaboration and let's hope, what's more important, for science, for obtaining in the near future, after years struggling to make the detectors work, what we all are aiming for, that is new knowledge about the nature surrounding us.

P. LA PENNA

Do you Speak Virglish?

I preface this article by stating that I am only too well aware of the difficulties inherent in learning another language. I have made thousands of errors while learning and speaking Italian, some of which are quite frankly too obscene to fill these prestigious pages.

That said, in my time working at

EGO, I have had the opportunity to learn a new language, in which I never imagined I would become fluent. Yes, welcome to the wonderful world of Virgo-English - 'Virglish', if you will.

I will hereon explain some of the fundamental turns of phrase that constitute the lexicon of this nascent language and endeavour to provide their translation or equivalent in English.

So, let's begin with one of my favourites:

Virglish: 'What this means?'

English: Quite simply 'What does this mean?' Note the simplified structure, lack of verb and pluralizing of 'mean'.

Virglish: 'Seeniall'

English: 'Signal'

Virglish: 'For what regards...'

English: This is a literal translation from the Italian 'Per quel che riguarda...' In English the nearest translation is 'Regarding the...'

Virglish: 'Luckily'

English: This is actually a false friend and means 'hopefully' in English.

Virglish: 'Strange touchments'

English: Difficult to define this one, although I must say that I like the idea of translating it as 'Strange encounter'.

Virglish: 'Kernowledge'

English: 'Knowledge', but pronounced with the 'k'.

Virglish: 'In fact'

English: 'Infatti' in Italian and 'En fait' in French. The nearest English equivalent would be 'indeed'.



Virglish: 'This night'

English: Yes, I know it sounds like the beginning of a cheesy 80s soft rock anthem, but it is to be found hundreds of times littered throughout the Logbook. The nearest English equivalent would be either 'Tonight' or 'Last night', depending upon the context.

Virglish: 'Give an eye to this'

English: I must confess that I think I created this one, it being the literal translation of the Italian 'Dai un'occhiata a questo'. The English would be 'Have a look at this'.

Virglish: 'We have been working hardly at the NE'

English: Tricky one this one as in English it literally translates as 'We have been doing practically nothing at the NE'. In reality, the English would be 'We have been hard at work at the NE'.

Virglish: 'In the next future'

English: A very common Virglish phrase. Literally translated as 'In the near future'.

Virglish: 'Let's make it working!'

English: A bold Virglish exclamation this one, the translation of which would be 'Let's make it work!' Note the use of the gerund instead of the infinitive, a common Virglish feature.

Virglish: 'Do you can...'

English: This has to be said very slowly, with significant pauses between each word. As for the translation, as yet, I have absolutely no idea!

In addition to these classic examples of Virglish there are many additional hidden rules, such as sporadically dropping the indefinite article from a phrase and pluralizing the noun. For

example, 'Have a good holiday!' becomes 'Have good holidays!' See, it's not as easy as you first thought.

So, 'for what regards' Virglish, we can say that 'we have given an eye' to its structures and have increased our 'kernowledge'. 'In fact', if we 'luckily' avoid any 'strange touchments' and continue to 'work hardly' we should 'in the next future' be ready for the advanced course. Now, 'let's make it working!'

G. HEMMING

3rd EGO/VIRGO Biathlon Relay Run

With this year's edition, the third one, the EGO/Virgo Biathlon Relay Run becomes an established tradition of our community. As you may remember, a picture of the 2006 competition was published on the cover page of the first issue of this newsletter. The EGO/Virgo Biathlon Relay Run, consists of a run along the two arms of the interferometer. back and forth (about 12 km). Competitors are teams of athletes. each one covering a section of the whole distance (it is a "relay" run); the different sections are covered by foot or by bicycle (it is a "biathlon").

In 2007 the run will take place during the July Virgo week; we preannounce it early to allow the formation of the teams and the training of the athletes; the exact date will be decided together with the detailed collaboration meeting agenda.

The competition will be followed by the traditional party offered by EGO.

The team to beat is Napoli: they won the first and the second edition, in 2004 and in 2006.

From the technical point of view, two changes will characterize the 2007 run:

since, in July, Virgo will be taking data, the turning points at the end of the arms will be advanced 100 m before the End Buildings, in order to avoid seismic noise at the sensitive end mirrors

the two bicycle sections will be joined in a single one, 6 km long: in this way the performance of the cyclist will be more challenging and more relevant with respect to the pedestrian sections; last but not least it will be easier to provide bicycles for all the athletes. The runners are invited to organize training sessions soon, possibly participating to the Strapazzata (April 25) and to the Pisa Marathon (May 13 - http://www.pisamarathon.it/home.php).

C. BRADASCHIA

EGO CRAL

In a matter of just a few days EGO

will have its own Corporate Recreational Society - Centro Ricreativo Aziendale Lavoratori (CRAL) under Italian law. The scope is, as for each sporting or social society, to stimulate the gathering of the employees of EGO and of all of the groups and laboratories associated to it. In particular, the young foreign people will have the possibility to better insert themselves into the local community, taking part in recreational activities such as trips, shows, going to the gym, photography, football, etc.

The EGO Direction has been informed of the desire of the EGO staff in this area, based on the strength of a vote, which was taken as being unanimous, in a general assembly of personnel. The Director, favourably interested, has mentioned it to the Council and has been able to obtain a certain sum for initial work for a five-a-side football field (dedicated to the memory of the colleague Gianfranco Pagani). The CRAL constitutional document at the Register Office will soon be ready and, from that moment on, we will require the availability and collaboration of all colleagues, through the membership drive and in terms of the good will to propose and achieve initiatives inside the CRAL.

> R. COSCI, CRAL PRESIDENT M. D'ANDREA, CRAL VICE-PRESIDENT

To Know the Road, Ask those Coming Back

Given that our last two bicycle tours have seen us remain in the area between EGO and Pisa, I thought it might make for a pleasant change to instead tackle the area to the south of EGO. With this in mind, I took to my bicycle on the weekend of WSR10 to follow the road to Fauglia and can therefore vouch for just how windy the conditions were!

Fauglia is renowned locally for it's olive oil, good food and restaurants, and is a recommended destination for the many connoisseurs amongst 'h' readers, so let's get underway.

Route 3: To know the road, ask those coming back

Distance: 10 km

Duration: 40 minutes

We start by leaving the gates of EGO and heading right along Via Amaldi. When we come to the junction with Via Marginata, we head left and then cross the bridge over the river (1). We soon pass the old, seemingly abandoned, farm buildings in Grecciano, and arrive at a fork in the road, familiar to all who frequent the 'Delle Colline' or 'La Gatta e La Luna' restaurants (2).





Here we follow the pot-holed road to the right and cross over the bridge that takes us over the FI-PI-LI. We remain on this road until wereach Via delle Colline (3), where we turn right. This road represents the most heavily congested part of our trip, but, as you will see, this does not mean that there is a lot of traffic. The cars tend to pass by pretty quickly, however, so mind your step.

We stay on Via delle Colline for approximately three hundred metres, before turning left onto the, apparently name-less, road that brings us to Fauglia, which is in fact signposted at this point (4). From this point on take your time and enjoy some of the truly stunning views available as we look out towards Monte Nero, which broods over Livorno on the coast below. The first part of the road is pretty flat and, at first glance, appears to be quite leisurely. However, if it's a windy day, you may well soon find yourself walking, as the crosswinds prove to be just too much to handle (5).

We will soon be fondly remembering the flat part of our journey, as we are shortly to begin the climb up to Fauglia itself (6). While not being too steep, it is a steady climb as the road winds up and up and on more



than one occasion we will be left thinking, 'after this corner we must surely be there' before it actually becomes a reality. In the meantime, there are a number of old villas to be appreciated that help to render the hill slightly less arduous.

All finally becomes worthwhile when we reach the summit and enter into the town itself (7). I recommend following the main road straight through to the southern most part of town, where little streets inter-mingle with piazzas and restaurants. At this point, we can relax and wind down before our trip back to EGO or, for those returning back to Pisa, the not to be missed pit-stop at 'Chez Genin'. Let's just hope that the wind has died down a bit!

G. HEMMING

EGO Rest-Parade

Here at 'h' we have received a suggestion, from Jean-Daniel Fournier, to provide information on restaurants local to EGO. As much as we would enjoy touring potential establishments, we have instead decided to determine which places are worth visiting, and which are worth avoiding for that matter, by asking for reader's suggestions.

The aim is to create an on-going restaurant league table, which will be updated each issue and provide information that can be of use not only to people visiting from afar, but also to those living nearby.

We've established a set of criteria for use in rating and a scale of 1 to 5, where 1 is a low rating and 5 high. The criteria are:

Food quality - Just how good is the meal?

Price - 5 is below €10, 4 is €11-20 ... 1 is above €41

■ Time required - Do you have to wait an eternity to be served or are the dishes on the table almost before your feet are under it? 5 is when you get to the bill in less than 60', 4 is 61'-80' ... 1 is above 121'

Friendliness of staff - Warm as a fire on a cold evening or cold as the Antarctic?

Location - Simple - beautiful or ugly?

Distance (from EGO) - 5 is 10 km, 4 is 20 km, 1 is 50 or more

It would also be useful to know whether each restaurant is best for lunch or dinner or both, and of course, it must be within reasonable distance of EGO.

After receiving the first answers we will try to establish a normalized scale for the various criteria and an overall score algorithm (you know physicists...).

Restaurants under contract with EGO for "canteen service" are not to be considered.

We look forward to receiving your r e c o m m e n d a t i o n s / u n - recommendations!

G. HEMMING

There's no Such Thing as a Free Lunch

A couple of months ago, never mind how long precisely, having little or no work to do, and nothing particular to interest us on the site*, while partaking of a healthy lunch, we, along with other colleagues, were discussing the fact that it appeared that one would normally have to wait longer for pizza than any other dish at one of the restaurants with which EGO has a convention. As a result of this discussion the two of us decided to don our investigative reporting hats

and have been secretly (well, not so secretly, actually) jotting down the time it has taken us to order either pizza or non-pizza, whenever we have lunched at the aforementioned establishment.

The following ⁰ histograms show the distributions of the ⁴ waiting time at the restaurant. The analysis, performed ³ over a period of ³ approximately one ² month of data taking, ^N exhibits a clear ¹ difference in the average waiting time ⁰ of about 2,5 minutes. distribution and mean value are comparable, even if the spread seems to be quite large in both cases ($\sigma =$ 6 minutes, mean standard error = 1':40").

This means that, taking into account the average EGO hourly salary, this difference in the average waiting time corresponds to about €10,4 per month per person, which, instead of being profitably paid by our institute for the benefit of research activity, is wasted on lounging around at a restaurant, and taking and analysing food waiting time data, instead of being dedicated to gravitational wave investigation. So, please, no more pizza from now on, only the dish of the day (plat du jour). And speed up the chewing.

* Please note that here we are actually paraphrasing a classic novel and did in fact have lots to do on-site, all of it of considerable interest as it happens. Can you guess the novel, by the way?

> P. LA PENNA G. HEMMING



Ciao Matteo, Matt and Lisa

"Some years ago my professor of Experimental Gravitation at Pisa University, Francesco Fidecaro, organized a visit to the "Virgo site". I barely knew anything about Virgo at that time, and I did not have any idea of where the site was located.

Leaving Pisa, after a few kilometers I realized that the way to the Virgo site was exactly my way to go home!

"Strange that a big experiment is close to Collesalvetti", was my first thought. You know, it is difficult to imagine Collesalvetti as an important center of scientific research. Anyway, I am sure it was a coincidence that my house happened to be 7 minutes from the site (they would probably be 5 with a better road), but after more than five years working here, I often refer to Virgo as home as well.

It is likely that I have spent more time in the control room than anywhere else in the last few years. Even worse, even when I was not physically there, most of the time I continued to think about Virgo stuff. So often has Virgo been even in my dreams (or nightmares...jumPs!) that I guess I tuned the B2_3f demodulation phase when I was sleeping almost as many times as I actually did...and I can assure you, that has been a lot!!

It is true that this job is timeconsuming, but I have to admit that I am largely responsible for having let Virgo be a large part of my life. What is worse than becoming a very good friend of your "coordinator"? Probably only go to live together with a colleague at least as crazy as you, if not more...(in my case definitely more!).

Most of the readers know that I have done both of these outrageous actions and in Italian somebody would say "chi e' causa del suo mal pianga se stesso", so I won't complain more.

The fact that my closer companions in this adventure are leaving as I am doing gives me more the impression of a big change.

On the other hand, such very good people are here to continue, that I am happy to leave knowing that the interferometer is in "good hands".

I am sure that as well as me, Matteo and Matt would like to say good luck to the Commissioning group, to the whole Virgo Collaboration, and to the EGO staff for many other successes over the next years.

And I am sure that, in the future, your adventure will always be a little bit ours as well."

Lisa Barsotti

Note by the editor:

Lisa Barsotti and Matt Evans left for MIT on March 22, Matteo Barsuglia will leave for one year traveling around the World on May 1st.

Keeping on Going

March 1st Adalberto Giazotto

retired from INFN, but has been hired has senior INFN-associate. Several people have this status, but I have been told that Adalberto is the only one who got it the exact day of his retirement.

In its extraordinary meeting, on January 29, the EGO Council appointed Adalberto as VIRGO member of the "Liaison Group", in charge of monitoring the functioning of the LIGO/VIRGO MoU and of its addenda.

It is always nice to see Adalberto working, his enthusiasm for "the problem of the day" and for new detectors, always willing to make the most difficult experiment in the

GOOD NEWS!

Welcome to **Sara**, born December 22nd 2006.

Our congratulations to Antonio and Claudia Pasqualetti.

Best wishes to **Roman** and **Claudia Bezuszko** who just married!

world. Pushing people, while smiling, to make ideas work, deep inside the most difficult experimental problems.

This is the Adalberto I personally have known for a long time. I remember the very beginning, when we used to work in a small experimental hut called "la chiesina" (the little church), with a lot of webs (the ones made by spiders), making experiments with very little equipment, constantly solving unaffordable experimental problems. Always pushing hard to deeply understand the experiment and obtain more than possible for a human being.

Our congratulations to Adalberto, for his unbelievable extraordinary enthusiasm and endurance! A. DE VIRGILIO

PERSONNEL MOVEMENTS 01 Dec 2007 - 28 Feb 2007

ARRIVALS

Collaborators

Sebastiaan Swinkels Comissioning Project

DEPARTURES

Staff

Michele Nassi Technical Assistant for the Operation of the Interferometer, Interferometer Operation (Operations)