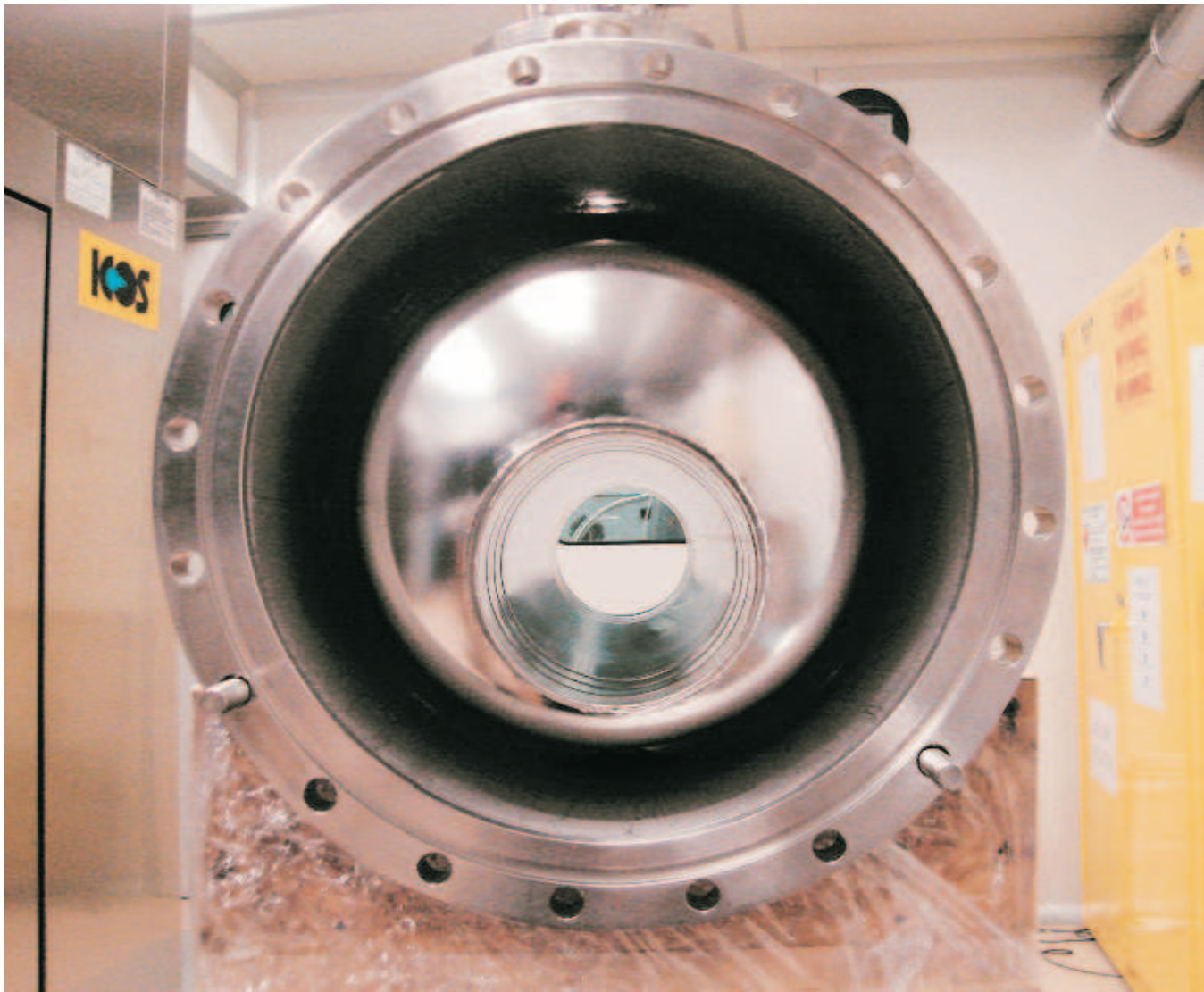


# h

THE GRAVITATIONAL VOICE

number 8  
**JULY 2008**



**SCIENCE & TECHNOLOGY**  
What is Signal Recycling?  
Virgo is getting cool

**NEWS FROM THE SITE**  
The Operators and *h*  
The broken window

**LIFE IN CASCINA**  
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Sports in Cascina



News from EGO and VIRGO

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The content of this newsletter does not necessarily represent the opinion of the management.

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## EDITORIAL

The beginning of this h8 issue is an apology. It is not a nice way to start, but we owe it to our readers. We apologize for releasing this issue with a delay of a whole trimester. This was due, at least this is our excuse, to a very intense period of activity for many of the editors: cryotrap installation and test, March LIGO-Virgo meeting in Caltech, April Virgo week, GWADW at Elba, VESF School on GWs and, when we were quasi-ready to come out with more than one month of delay, the implosion of a viewport on the North End Tower. Conclusion: we decided to skip a term and to publish h8 on the date of h9. With the apology over, the original editorial can begin.

This 8<sup>th</sup> issue of h concludes the second year of life of our newsletter. We editors really try to do our best to make h interesting, pleasant and even a little useful; in this effort all of the present editors have participated, as well as many who were in the team in the past.

The 8<sup>th</sup> cover shows the "cryotrap" and in the text we publish a short article to let everybody know what this new device is. It is the first relevant hardware upgrade of a series to be completed this summer in order to transform Virgo into Virgo+.

In this issue we recommend "What is signal recycling?" by Diego Passuello, it is interesting, but hard: science is not easy; make an effort and read it! It can be seen as the first step on the path to a deeper understanding of signal recycling: the following steps are the slides presented by Gabriele Vajente at the May 22 Advanced Virgo bi-weekly meeting ([http://www.cascina.virgo.infn.it/advirgo/biweekly/2008/2008-05/vajente\\_220508.ppt](http://www.cascina.virgo.infn.it/advirgo/biweekly/2008/2008-05/vajente_220508.ppt)); the last steps are the two notes by Gabriele: VIR-030A-08 and VIR-032A-08.

We also suggest to not disregard the second part of "Say it in English, not in Virglish": it may be useful to many of us, even if it is clear that the first part has not produced particularly relevant effects. "Walking around Vicopisano" by Filippo Menzinger suggests a pleasant walking tour in the neighborhood of Vicopisano where the former EGO director has a nice antique house. There is also, of course, an article about the NE tower accident.

C. BRADASCHIA

Cover picture:  
Front view of the cryotrap as seen by a photon travelling towards the detection bench.  
Photo taken by C. Bradaschia

# The Operators and $h$

Interviews done by A. DI VIRGILIO

**Our journal  $h$  is now two years old** and, having been in the editorial team since the beginning, it is only natural for me to want to try to understand if we are doing something good for our community. With this in mind I had a meeting with the six EGO operators.

Since  $h$  was conceived to be a tool for people working around Virgo, the impact of it with the “operators” plays the role of a “litmus paper”. They are the technicians that run Virgo from their amazing and beautiful three-screen console, where the mouse moves with continuity from one screen to the other. As a physicist, not heavily involved on the Virgo site, in general I don't know much about the people working around Virgo, but all of us have been in contact with the operators. During my shifts I was really impressed. I saw how they exchange information amongst themselves during a shift change and how the routines of a shift have become well defined, a huge difference if we compare with the situation at the beginning, during the mini-runs for instance, before SR1. But, despite the fact that there is a tight routine to follow, you can feel how seriously they take their duty, and I must say that I never had the impression that they were taking anything superficially.

I have known Vincenzo Dattilo, who takes care of their training, for a long time and I can see Vincenzo's work in their attitude. They have been very well selected, and very well trained as well. I remember how interested they were and all the questions they asked me during my shifts.

They accepted my request to discuss  $h$  with me, and, with enthusiasm, Fabio, Federico, Francesco, Marco, Nicola and Rodolphe answered my questions. They said that they read

our journals, and are interested in all of the articles, enjoying particularly the Virglish parts and they also like all of the parts relative to the infrastructure. The only complaint they had was about the scientific part, which is usually too heavy and written in a language that is too difficult for them. I was a bit surprised, since during the shift their interest in science was evident, but there is of course the problem that it is very difficult to write about physics for non-physicists. Should we stop writing scientific ‘papers for pedestrians’? It's hard to say. This is an area in which we should improve. In general to write for non-physicists is not easy, it takes time, and it is not our job. Moreover the scientific papers could always be interesting for newcomer physicists, young students, etc. One thing that could be done could be to add to scientific papers a very short summary in which the essential idea is expressed.

The operators also stated that they would be very interested in knowing what are the sources of gravitational wave signals, astrophysical signals, and also where the large amount of data goes...and how they are processed.

They enjoy their work, which is not boring, are interested in what they do, and the team is a good friendly one. On a personal note, Nicola, one of the team, has recently become a father for the first time.

In addition, they think that a bridge should be dedicated to Mehdi, a former operator who managed to destroy a local bridge with his car - perhaps it would be nice to keep track in “ $h$ ” of funny things, which take place in everyday life. They also told me of an occasion in which one of the security guards was showing Virgo to his friend. He was not asking for help, but was simply explaining Virgo in his own

language, and it sounds as though it was better than a movie...

In summary, they are happy with  $h$ . They read it and would welcome simplified scientific articles, and why not add something about the everyday life around the Virgo apparatus. There is of course something to complain about: the operators are all men - no women!

## They said ....



### **Rodolphe:**

*On  $h$ : In my opinion,  $h$  is an easy way for us, who are involved most in the operational part of Virgo, to have feedback on the situation of the collaboration.*

*On him: This job is the first job I have ever had, and I think there is no better way for me to start in my professional life.*

### **Fabio:**

*On  $h$ : In my opinion  $h$  is the best scientific publication of all-time, better than "Focus", "National Geographic", "Science" etc...*

*On him: This experience is something new, my previous jobs were completely different and at the beginning I was a fish out of water. I asked myself "What am I doing here?", but with time and the help*



*of everybody, I have discovered a new and very interesting "world" and I have met a lot of wonderful people.*

**Francesco:**

*On h: h is an interesting magazine. On him: I am very happy working in Virgo because I can work with people coming from all parts of the world.*

**Nicola:**

*On h: As I said to Angela at the meeting concerning "h" with the other operators, the magazine is very interesting even if some articles are quite "hard"!*

*On him: Working in EGO is very motivating because all activities are completely out of the ordinary and also all of the colleagues are out of the ordinary. This is a good opportunity for me to learn a lot of things and to improve my knowledge in English, computers, science... and CLEAN OPERATIONS.*

## The Broken Window

**The story began with the following entry in the Virgo Logbook, made on Friday May 9, 2008:**

“The morning was spent to close the END towers; at 12:15 LT the towers were closed and the evacuation started.

At 13:45 LT something strange happened in NE tower: on the

plasma screen we saw the payload moved a lot for a while. The situation was not clear so we decide to open again the tower in order to make a visual inspection. Investigation still in progress...”

That was a cold shower while we were preparing a 10 day data-taking in order to

take a snapshot of the good progress, recently achieved: world record sensitivity below 40 Hz, first hints of the benefits of the thermal compensation system, etc. EGO and Virgo reacted promptly: the planned shutdown has been anticipated and the upgrade of Virgo to Virgo+ was started a few weeks in advance.

Now we know what happened. During the evacuation of the NE tower, when the inner pressure was about one tenth of an atmosphere, one of the 150 mm glass viewports failed. A part of it was projected inside the almost empty tower, leaving a triangular aperture of about 1/3 of the glass area. Several fragments of glass hit the aluminium reference mass penetrating into it; other fragments damaged the surface of the mirror; at least one fragment hit a facing viewport inducing a crack in it, although not enough to produce an aperture; two absorbing glass baffles were also broken.

Immediately after the accident, the investigation and recovery activity began. The glass fragments and the air flow induced oscillations on the payload large enough to break the mirror wires, but not the reference mass wires; the mirror did not fall down, but landed inside the reference mass.

The air flow was violent, but the limited aperture made the pressure rise relatively slowly, it took more than one minute to reach atmospheric pressure in the tower. Inside the tower there were fragments as fine as dust up to the

large valve, several metres away. In the misfortune we were lucky: the window failure happened during tower evacuation, hence the large valve was still closed. If it was already open we would have polluted the whole North tube and the violent air wave could have reached the central towers with disastrous effects on the large optics. A task force was immediately set up to define the recovery action, after investigating the cause of the failure. It is composed of Carlo Bradaschia, Vincenzo Dattilo, Antonio Pasqualetti and Michele Punturo, Michele acting as coordinator, with the help of Henrich Heitmann. A key role is being played by Frederic Richard, EGO safety officer.

One important meeting took place on June 4 with experts from CERN, LIGO, IFREMER Toulon, INFN Frascati and Stazione Sperimentale del Vetro in Murano (the island near Venice famous over the centuries for their glass blowers). Detailed analyses will be performed by SSV and by CERN. EGO/Virgo and LIGO are developing, in parallel, diagnostic means to inspect windows pre and post installation. Finite element models are being studied and, last but not least, safety around viewports will be enhanced.

New protections will be designed to be installed on the glass windows whenever possible and strict rules for working in their vicinity will be enforced.

The recovery action is progressing rapidly. The NE tower has been carefully cleaned, all the viewports have been temporarily replaced by blank flanges and the large valve operation tested. The tower has been successfully evacuated and displacements or deformations have been measured, and compared with calculations. Having found no anomalies, the North tube evacuation has been started.

All possible causes of the failure are being considered: a manufacturing flaw, a successive accidental shock,

a weakness in the window design. The situation will be revised in mid July in order to plan the final recovery strategy, aiming to the goal of the Virgo to Virgo+ transition: a long term data taking period, VSR2, in parallel with "enhanced LIGO", mid-2009.

C. BRADASCHIA

## What is Signal Recycling?

In the previous publication of *h* we learned about Michelson interferometers with power recycling (*h7* How does a "recycled" interferometer work). Following on this we take a step forward and consider the "signal recycling" technique.

In agreement with the spirit of the *h* newsletter, a complete and formal treatment of the subject is well beyond the scope of this article. If you are aiming to an intuitive comprehension you can happily jump over formulas and over paragraphs written in italics. We will refer throughout this article to the figure below, showing the schematics of a Michelson interferometer, with a Fabry-Perot cavity in each arm, using both power recycling and signal recycling. Suppose that the end mirror S2 of a Fabry-Perot cavity is not fully reflecting but has reflection and transmission coefficients respectively  $r_2$  and  $t_2$ ; in this case a fraction of the light will be transmitted beyond the mirror S2.

Denoting with  $R$  the field amplitude reflected toward the light source, with  $T$  that transmitted beyond the cavity and with  $B$  the one inside the cavity, a simple analysis based on energy conservation will give the following field values for the resonant case:

$$\begin{aligned} |R| &= |A| |r_2 - r_1| / (1 - r_1 r_2) \\ |T| &= |A| t_1 t_2 / (1 - r_1 r_2) \\ |B| &= |A| t_1 / (1 - r_1 r_2) \end{aligned}$$

and for the anti-resonant case:

$$\begin{aligned} |R| &= |A| (r_2 + r_1) / (1 + r_1 r_2) \\ |T| &= |A| t_1 t_2 / (1 + r_1 r_2) \\ |B| &= |A| t_1 / (1 + r_1 r_2) . \end{aligned}$$

In this case the finesse is:

$$\pi (r_1 r_2)^{1/2} / (1 - r_1 r_2)$$

It can be seen that the resonant condition (when the light intensity inside the cavity is strongly amplified) is reached only in a small frequency interval whereas the anti-resonant condition (the light intensity in the cavity is much lower than that of the laser beam) holds for all the rest of the free spectral range; technically we would say that such a cavity has a small line width. A notable condition is when  $r_1 = r_2$  i.e. input and end mirrors of the cavity are equal; the above formulas tell that in this case, in the resonant condition, all the light is transmitted beyond the cavity and no light is reflected back to the source. On the other hand in the anti-resonant case the reflectivity is very close to one whereas the transmittance becomes very small. It is just on this property, that is to completely transmit the radiation resonating in the cavity and to reflect all the other frequencies, that the "cleaning" action of the Virgo input and output mode cleaners is based. For instance with two mirrors with reflectivity  $r_{1,2} = 0.9985$ , which corresponds to a finesse of about 1000, we get for the anti-resonant radiation a reflection coefficient of 0.99999887 and a transmission one of only 0.0015.

We can also say that a Fabry-Perot cavity behaves like a mirror whose reflectivity varies gradually between a minimum and a maximum depending on the frequency of the impinging radiation. We can use this "mirror" with its highest reflectivity as the input mirror of another cavity with a fully reflective ending mirror (S3).

The finesse of this new cavity is, a part a factor of the order of 1, equal to the product of the finesses of two resonant cavities built up respectively with the mirrors S1-S3

and S2-S3.

This composite cavity has obviously a very thin line width (typically some tens of Hz).

The modules of the fields inside the first and the second cavity are respectively:

$$\begin{aligned} |B_1| &= |A| t_1 / (1 - r_1) \\ |B_2| &= |B_1| t_2 / (1 - r_2) = |A| [t_1 / (1 - r_1)] [t_2 / (1 - r_2)] \end{aligned}$$

Rephrasing what has already been said in the previous article on *h7*, a classical interferometer working at the dark fringe will reflect all the light back toward the light source; the interferometer acts as a highly reflecting mirror placed at a distance from the source which is the mean value of the distances of the two terminal mirrors. If the two arms of the interferometer are constituted by resonant cavities, from the point of view of the light source there is only one resonant cavity having the input mirror placed at a distance equal to the mean distance of the two input mirrors. Placing a partially reflecting mirror, the recycling mirror, between the source and the beam splitter we get a double cavity: the first one built by the recycling mirror and the input mirrors of the interferometer arms and the second one built by the "average" of the arms themselves. If the first cavity is anti-resonant we obtain an increase of the intensity of the light impinging on the beam splitter, increasing in this way the interferometer sensitivity. This is the working principle of the power recycling technique.

In practice the end mirrors, being real mirrors, do not have a perfect reflectivity. The presence of losses in the Fabry-Perot cavities will affect noticeably the behaviour of the recycling cavity. Let us assume a loss coefficient  $p$  in the end mirror, so that its reflectivity is  $r_2 = (1-p)^{1/2}$ ; in this case the cavity reflectivity in the anti-resonant regime is anyway very close to 1 (due to the very weak field inside the cavity, the losses are negligible) whereas in the resonant condition the losses can be very

important especially in the case of very high finesse.

A simple computation shows that a resonant Fabry Perot cavity has a reflectivity very close to  $r_i = 1 - (p/2)(1+r_i)/(1-r_i)$  and the recycling cavity finesse becomes  $\pi (r_r r_i)^{1/2}/(1-r_r r_i)$ . Hence, when the Fabry Perot cavities are resonant, given their low reflectivity, the recycling cavity finesse is reduced. This is especially true if the finesse of the arm cavities are very high (as it is planned in Advanced Virgo and Advanced LIGO). A detailed analysis shows that it is better to slightly detune the arm cavities since the loss of sensitivity due to not fully resonant cavities is more than compensated by the gain of sensitivity due to the corresponding increase of the finesse of the recycling cavity.

Let us now suppose that some gravitational radiation of frequency  $\nu_g$  passes by. The lengths of the Fabry-Perot arm cavities vary and the light reflected by the cavities is phase modulated at this same frequency  $\nu_g$ . A Fourier analysis shows that the light coming from the cavities and going back to the beam splitter is the superposition of three spectral lines, i.e. it is a mixture of light of three different frequencies. The main line, called "carrier" has the laser frequency  $\nu_1$ , the second line has the frequency  $\nu_1 - \nu_g$  and the third one has the frequency  $\nu_1 + \nu_g$  (these two last lines are called lateral bands).

As we have noticed, in an interferometer working at the dark fringe, the carrier, which resonates in the arms is anyway completely reflected toward the recycling mirror, on the contrary the two lateral bands are transmitted towards the output bench. One can

also show that an interferometer working at the dark fringe will reflect toward the source all the light also if illuminated through the dark port (i.e. as from the output bench). So we can put a further semi-reflective mirror between the beam splitter and the output bench, building in this way another resonant cavity, the "signal recycling" cavity. Playing with the distance between the signal recycling mirror and the beam splitter we can change the resonant frequency of this last cavity and tune it at the frequency of one of the sidebands:  $\nu_1 - \nu_g$  or  $\nu_1 + \nu_g$ . In this way the sensitivity of the interferometer will be enhanced for the particular gravitational frequency  $\nu_g$ . This is the signal recycling technique, that can be particularly fruitful to tune the best interferometer sensitivity on a gravitational wave source of known frequency.

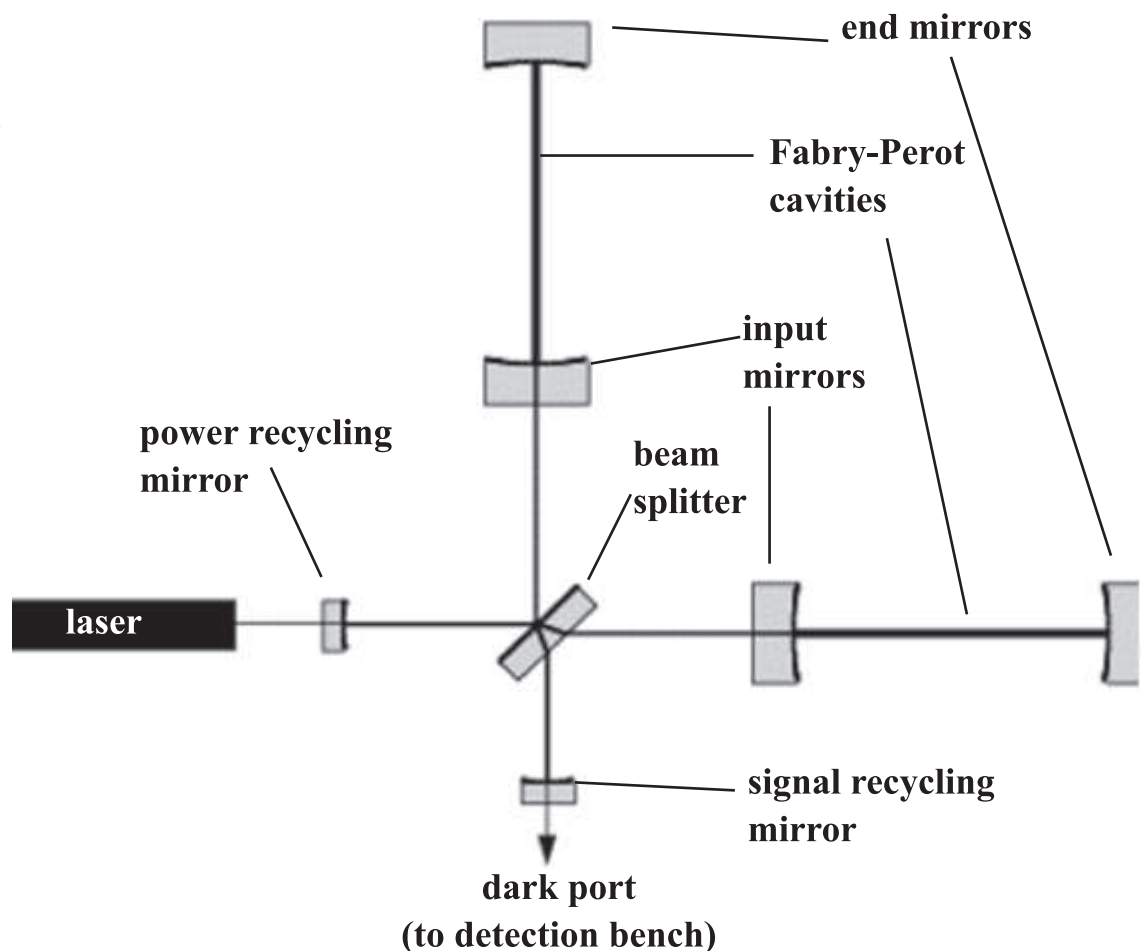
*In order to completely optimise the detector sensitivity, we could also play the game of slightly detuning the arm cavities; if we detune the*

*arms by a quantity  $\nu_g$ , we get a greater efficiency on the building up of one of the two lateral bands, increasing the interferometer sensitivity for this particular frequency.*

At this point it is clear that the interferometer sensitivity is a function of many parameters (arms and recycling cavities finesse, relative positions of beam splitter and recycling mirrors, etc..) so that only a careful and complete numerical simulation and analysis is able to predict with enough accuracy the optimal sensitivity curve to detect a particular gravitational signal.

For more information and a very detailed analysis see: The VIRGO Physics Book (Vinet, <http://www.cascina.virgo.infn.it/vpb/>); Advanced Virgo sensitivity curve: cavity finesse and signal recycling tuning (G. Losurdo, Virgo Note: VIR-024A-07).

D. PASSUELLO



## Virgo is getting cool!

If you attended the weekly meeting in the last months then you have surely heard the term “cryotrap” several times. But what is a “cryotrap”?

The story starts from the requirement for the residual gas pressure inside the 3 km arm tubes to be below  $10^{-9}$  mbar. This is necessary in order to keep the noise generated by the optical index changes in the Fabry-Perot cavities at least 10 times under the best sensitivity of interferometers which are 10 times more sensitive than Virgo (Advanced Virgo and beyond). The largest index changes are expected in the statistical fluctuations of the number of residual gas molecules inside the volume occupied by the Gaussian beam. Lower pressure produces lower fluctuations.

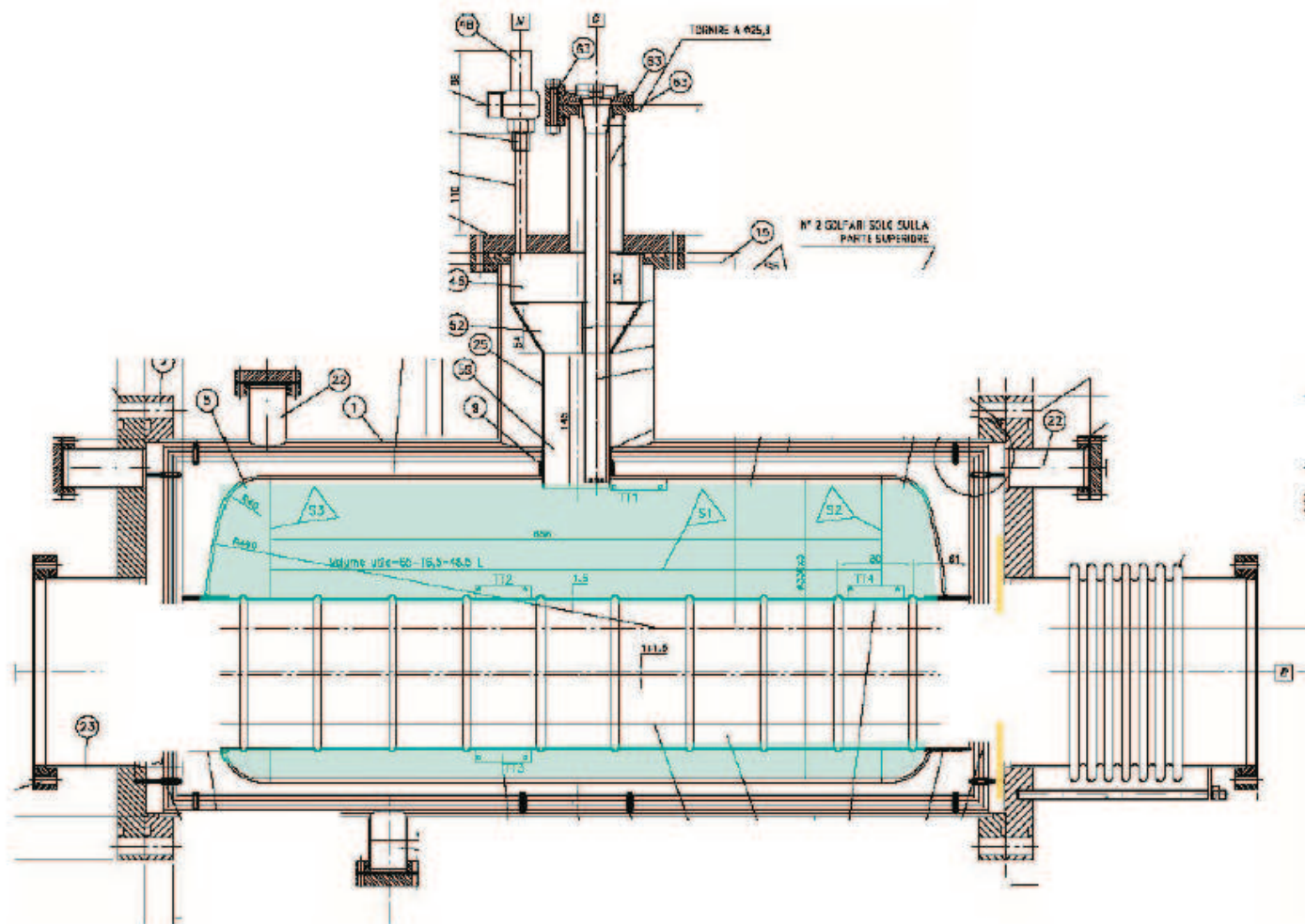
The large Virgo mirrors must also be kept in an environment which is as hydrocarbon free as possible in order to avoid pollution. This is why the tall mirror towers are split into three parts by the separating roof. This modification is done to insure that the prescribed residual pressure in the tubes is met and that the mirrors have the appropriate cleanliness in the lower tower compartment. It also permits less stringent conditions in the upper tower compartment containing the “dirty” SuperAttenuators.

Similar (not extremely clean) conditions are present in the Injection and Detection towers. These towers contain complex optical benches equipped with a large variety of optical, mechanical and electronic devices. The towers

communicate with the rest of the interferometer only via light beams and their vacuum volumes are kept separated from the rest by transparent optical windows. These “Brewster windows” are frequently blamed for noise. The window between Signal Recycling tower (SR) and Detection tower (DT) is more frequently blamed since there is some evidence that its vibrations can modulate either the beam or the diffused light. This modulation appears to contribute to the noise affecting the output signal of Virgo (the “Dark Fringe”).

We needed a device to reduce the migration of bad molecules from DT to the interferometer, without putting any physical object in the light beam path.

This device is the “cryotrap”!



The idea is very simple. Replace the room temperature tube connecting SR to DT with a tube with a very cold inner wall. The poor molecules trying to migrate from DT to SR stick to the cold wall if they hit it and they are trapped.

A longitudinal cross-section of the cryotrap is shown in the drawing and an axial view of the open vacuum tank is shown in the picture. The real object consists of a vacuum tube containing a cylindrical container full of liquid nitrogen (light turquoise in the figures) at its boiling temperature of 77 Kelvin ( -196 °C ). In this configuration the only passage between DT and SR is the hole of the cold tube. Its inner wall “freezes” and captures a large fraction of the passing molecules. The victims are most of the polluting hydrocarbons (which are condensable at that temperature) and water which we don't care about as it is non-polluting. The cryotrap is now installed thanks

to the effort of the EGO/Virgo Vacuum group, led by Antonio Pasqualetti (in particular Roberto Cosci, Riccardo Macchia and C. B.). The trap performance is now being characterized. Apart from the capability to stop pollutants (which is its purpose) the operation strategy also has to be understood. This means investigating refill / regeneration intervals, mechanical noise due to liquid nitrogen evaporation, bubble formation and safety.

C. BRADASCHIA

## The Ludoteca Scientifica of Pisa

**The Ludoteca Scientifica is a** collection of simple experiments and games created with the aim of showing and explaining to visitors, of any age and culture, natural

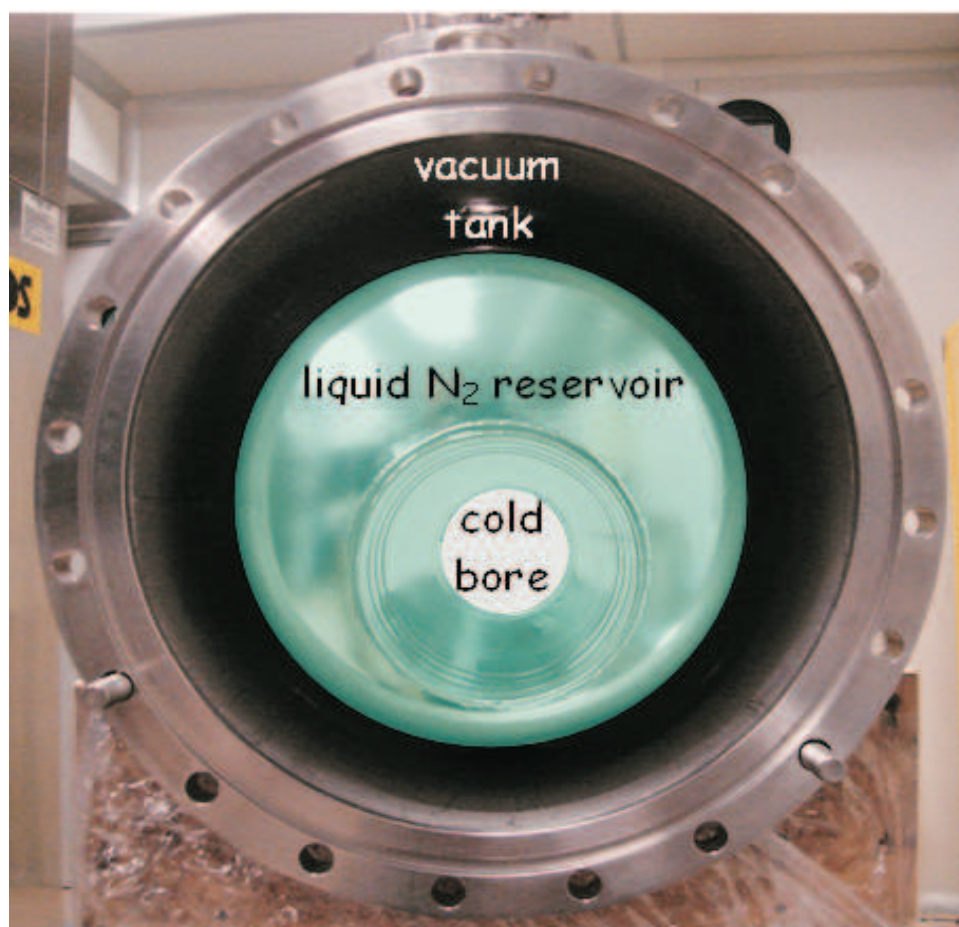
phenomena that may be found in everyday life. A wide variety of themes are on display, spanning from physics to chemistry, to biology, to computer science.

The Ludoteca took place this year in Pisa at the exposition area called Vecchi Macelli (Old Shambles) from April 7 to May 10 (<http://www.ludotecascientifica.it/index.htm>). It was a nice place in which to spend a couple of hours on a Sunday afternoon with your children. The inspiring principle is expressed by Galileo Galilei: *"E' sciocchezza cercar filosofia che ci mostri la verità di un effetto meglio che l'esperienza e gli occhi nostri"* (It is stupid to search for a philosophy that is able to show the truth of an effect when it is better understood when experienced by our own eyes).

To obey a concept attributed to Confucius: *"if I hear I forget, if I see I remember, if I do I understand"*, experiments are, as much as possible, “hands-on”. They have been conceived to stimulate observation and intuition, the desire to understand and search, and the joy of finding answers from direct experience and logical deduction.

Once again in the 2008 edition the Ludoteca had a few Science Laboratories, supported by local scientific institutions. For the fourth year running, EGO and the Virgo-Pisa group organized five Saturday morning workshops, in which a small group of high school students, possibly with one or two teachers, built a “€100 laser interferometer”. The aim is to show that with easily procurable components it is possible to build an instrument that is sensitive to sub-micrometric displacements.

The workshops were coordinated by a Virgo/EGO scientist (the author of this article). All operations were undertaken by the students: from drilling holes on the wood-chip “optical bench” to gluing mirrors with epoxy droplets, to building a



Front view of the cryotrap as seen by a photon travelling towards the detection bench. The turquoise colored reservoir is full of liquid nitrogen at -196 °C.





*Ludoteca Scientifica: Interferometer builders in action!*

(fairly) adjustable mirror support. At the end of the work, the students took the interferometer to their school for further experimentation and demonstrations.

C. BRADASCHIA

## Sports in Cascina

As spring draws near, everybody, even scientists and engineers, are slowly coming out of their hibernation. Reliable eye witnesses swear they saw some specimens (of both categories!) jogging along Virgo's arms at lunchtime. Is it because the 4<sup>th</sup> EGO-Virgo Biathlon Relay Run is getting closer?

As our affectionate readers might or might not remember, last year's was in June and for the 3<sup>rd</sup> time in a row the winner was the team from Naples. Among the disgruntled losers, some were contemplating rising to the challenge again to beat the odds in one year. Well, the moment of truth has almost arrived. Taking the opportunity given by the

next Virgo Week here in Cascina, a new chance will be given to all interested teams next July 16<sup>th</sup>. To tell the entire truth, some reservations about the formula of the competition were privately shared among participants, especially regarding the last leg of the relay, the 3 km run. The Run Organizing Committee showed a favorable inclination to listen to alternative proposals. One of them could be to split the last leg in two stretches of 1.5 km,

having then teams consisting of five members instead of four, but all readers are warmly invited to come forward with any suggestion they think may improve the appeal and the quality of the competition, not to mention level the field.

Other outdoor activities are worth mentioning: the CRAL football pitch at the end of the North Arm is now ready and has hosted four matches of five-a-side football. Players and supporters alike have been very enthusiastic and despite the heat, have been in awe of the quality of football being played. Who would have thought there were so many people at EGO of Brazilian descent? Almost as impressive as the level of skill is the list of nicknames, which so far includes: the Blue Arrow, the Pirlo of Sussex, the Black Spider and Bobo.

For the less active among us a completely new horizon is opening before our eyes: in a so far undisclosed location somewhere on



site, table football sightings have been confirmed by a team of international observers. Their reports are still under evaluation, but it seems there are reasons to believe it was not a simple illusion. Also, The EGO C.R.A.L. offers the possibility to those who decide to join it to have access to a gym, and play table tennis and darts (currently without beer). So, if you're considering taking up a bit of sport, the number of possibilities is positively overwhelming.

In addition, on April 25<sup>th</sup> in Pisa, Parco San Rossore, there was the 2008 edition of la "Strapazzata" a road race with four different courses, the longest being a half marathon (21 km).

EGO had his representative there: Elena "ironwoman" Cuoco covered the 6km leg in an excellent 40 minutes. Well done, Elena!

F. NOCERA

## Interviewing the new figures at EGO

by S. Perus

**In April 2008 the EGO Council** made two significant decisions regarding the internal organization of the Consortium: the appointment of Francesco Fidecaro (newly nominated as Virgo Spokesperson) as Scientific Director and of Henrich Heitmann as head of a new EGO department called Technical Coordination.

Everyone knows Francesco and Henrich who have both been involved in Virgo for years. However we were interested to obtain their first impressions on these new mandates and to ask them a few questions (indeed the same questions as you will discover here below..).

And I had the pleasure to interview them!

## Interview with Francesco Fidecaro

SP: Hello Francesco! First of all, thank you very much for allowing *h* to interview you! If you are ready, let's start it right now.

It's been almost two months since your appointment as Virgo Spokesperson and as EGO scientific Director, how are you doing?

*FF: Well, my mandate started like a rocket! When the view port broke there were lots of worries at the beginning but then the accident has been very well managed, which was recognized by the STAC. Let's see it now merely as a setback, a lesson for the future and an indication of the work which is ahead. Then there have been the STAC and Council meetings who both recognized the work achieved and the very good behaviour of the Virgo collaboration but I take no merit for that. The Committees were impressed by the*

*work done under the guidance of my predecessor!*

SP: A few words on your mandate as Virgo Spokesperson and EGO scientific director. How do you find this new experience?

*FF: In the Virgo collaboration, there are groups with their own features. They have a lot to bring and therefore it is important to enhance the competences and the know-how. In my opinion, this is possible by improving the communication, the participation. It is also possible by improving the integration with EGO which obviously provides support on site but also participates in the scientific life and in the management of the project. Ensuring a better integration and more exchanges are key success factors for the next years.*

## Interview with Henrich Heitmann

SP: Hello Henrich! First of all, thank you very much for allowing *h* to interview you! Let's get started! Henrich, it's been almost two months since your appointment as Head of Technical Coordination, how are you doing?

*HH: Well, my workload has doubled, even tripled! I am trying to find my way and to understand how to deal with this new challenge. I am also discovering a lot of new tasks that I try to bracket and I have now to learn how to cope with these. People seem rather happy so far to have one more person to help.*

SP: A few words on your new mandate. How do you find this new experience?

*HH: There is a written document which describes what I am supposed to do. But I am discovering that every new day has*

*its own emergencies, therefore I try to assess them and to give priority. You know, this is a transition period; there are many new coordinators with whom I would like to cooperate!*

SP: Is it correct to consider this new figure a facilitator?

*HH: I hope that people will consider it as a figure who will facilitate and not complicate things! At the beginning people were rather afraid that the organization may have become more complex but once things will be well defined with the people concerned, that fear should disappear.*

SP: Up to now what is the professional achievement for which you are proudest?

*HH: I am absolutely delighted to see the current sensitivity curve. You remember the graph presented to*

## Interview with Francesco Fidecaro continues...

SP: Up to now what are the professional achievements for which you are proudest?

FF: *Me! (Laughter...) Surely the fact of participating in the realization of a detector which has extremely advanced features and gathers competencies difficult to find in order to reach our goal, namely detecting and studying gravitational waves in the best conditions possible. The interdisciplinary fields emerging from the different competences of the various groups are surely one of the most interesting things!*

SP: In your opinion, what are the major difficulties Virgo has to overcome?

FF: *A major difficulty is to put together work cultures and ways of doing which are different and which are often difficult to understand by other groups. In the past, getting the*

*approval of the project was surely one of the major difficulties and huge work was done by predecessors to convince the institutions to fund the project. Now we have a good apparatus but there are other challenges in front of us and these require further funding for which a lot of work is still to be done!*

SP: 3 words to describe you?

FF: *Well this is not simple... (Silence) I am attentive to others and ...for this kind of job you have to like what you do, considering that the research has a significant work tradition... and I like having a good atmosphere around me (laughs)!*

SP: A shortcoming?

FF: *(silence) ..... I usually think too much!*

SP: Tell us, what do you like doing in your leisure time?

FF: *I like going sailing, skiing, but now I do not have much time to practice. I also like hiking in mountains.*

SP: Your favorite place?

FF: *The Maiella in the Abruzzes. It's a mountain very closed to the sea which gets fresh air and has a lots of snow during the ski season so that you can go skiing in May!*

SP: Now that Italy and France are out of the European 2008, which team will you support?

FF: *Hum... that's a complicated question. I do not usually follow soccer ... I do not support any particular team and have no prediction!*

NB: obviously, at the time of the interviews the European Championship Final had not taken place.

## Interview with Henrich Heitmann continues...

*the Council which showed the progresses through all the curves? I have been working in Virgo for many years; from the engineering runs until today. To see how much we were able to get closer to the curve of the Virgo nominal value is a great achievement!*

*In addition, working in Virgo on site is different from working inside any other laboratory. It gives me the opportunity to work inside a vast collaboration, which is really a beautiful thing.*

SP: In your opinion, where are the major difficulties Virgo has to overcome?

HH: *Implementing the organization foreseen and making it work. Defining the interfaces and the responsibilities well. Deciphering the organizational issues and transposing them. At the personal level organizing myself and learning a new way of working to manage everything.*

SP: 3 Words to describe you?

HH: *Hum...answering this question requires a good knowledge of yourself. Surely people like Berlusconi used to interviews, would have an answer ready ...*

*I like very much living in an international environment, living abroad. I chose to work in Virgo because I find such big projects fascinating. They interest me a lot. I also try not to get involved in political matters. Maybe "neutral" could be used in that case.*

SP: A shortcoming?

HH: *(silence) ...I remember people told me that I stick only to things that concern me.. and beyond that I just do not consider them.*

SP: But it could be also a virtue!

HH: *That's true, it depends on the circumstances...I am sure that famous people have answers ready*

*for the media!*

SP: Tell us, what do you like doing in your leisure time?

HH: *Ah.. a much simpler question! Going for a ride on my motorcycle, hiking in mountains, diving although this activity is a little more complex to organize, exploring Tuscany..*

SP: Your favorite place?

HH: *I would say Italy, in particular Tuscany. You know I am not here by chance! I always wanted to go and live in Italy, and every morning when I come to EGO from Perignano with my motorcycle, I appreciate the landscape and the hills around me.*

SP: Is it necessary to ask you which team you are supporting during the 2008 European Championship?

HH: *Obviously Germany!*

# Say it in English, not in Virglish!

## (2nd part)

We are completing here the alphabetical tour of English words most heavily damaged “pronunciation-wise” in Cascina.

We must say that we feel a bit disappointed, not having been able to detect the smallest effect of the first part, published in *h7*.

Nevertheless we hope to see some result soon – spes ultima dea. For readers who missed *h7*, we

explain the method. We publish a list of the most crumpled words, indicating the correct pronunciation by the official English phonetic spelling. In addition we write each word phonetically in the two languages, that is as a French or an Italian would write it just to reproduce the correct sound. An accent is put before the accented syllable.

If you don't trust us, you can

physically hear the correct pronunciation of words at: <http://www.allwords.com> or <http://www.howjsay.com>

C. BRADASCHIA, S. PERUS

*NB: if you are thinking of one particular work of art that deserves to be added to our list of butchered words, please send it to Carlo or Severine.*

### Second list of butchered words

English spelling	Phonetic spelling	French phonetic	Traduction française	Italian phonetic	Traduzione italiana
high	'hɑi	'hɑi	haut	'hɑi	alto
house	'haʊs	'haʊs	maison	'haʊs	casa
idea	aɪ'diə	aɪ'diə	idée	aɪ'diə	idea
instead	ɪn'stɛd	ɪn'stɛd	au lieu de	ɪn'stɛd	invece
lower	'ləʊ.ə	'ləʊəʊe(r)	inférieur	'ləʊə	inferiore
measurement	'meɪz.ə.mənt	'mɛjɛʊmnt	mesure	'mɛjəmnt	misura
mirror	'mɪr.ə	'mɪrəʊ(r)	miroir	'mɪrə	specchio
origin	'ɒr.ɪ.dʒɪn	'œrɪdʒɪn	origine	'ɒrɪdʒɪn	origine
procedure	prə'siː.dʒə	prœ'siːdʒœ	procédure	prə'sɪɡiə	procedura
to produce	prə'dʒuːs	prœ'diʊs	produire	tu prɒdi'ʊs	produrre
product	'prɒd.ɒkt	'prɒdeʊkt	produit	'prɒdɒkt	prodotto
to promise	'prɒm.ɪs	'prɒmɪs	promettre	tu 'prɒmɪs	promettere
purchased	'pɜː.tʃəʊs	'pœtʃœɪzd	acquis	pa'ceɪsɪd	acquistato
Rome	'rəʊm	'reʊm	Rome	rom	Roma
science	'saɪəns	'saɪœns	science	'saɪəns	scienza
urgent	'ɜː.dʒənt	'œdʒœnt	urgent	'ʊɡɛnt	urgente
value	'væl.juː	'væliʊ	valeur	'vɛliʊ	valore
watt	'wɒt	'wɒt	watt	u'ɒt	watt
to write	'raɪt	'raɪt	écrire	tu 'raɪt	scrivere
wrong	'rɒŋ	'rɒŋ	faux	ron	sbagliato

### EGO CAFETERIA

As announced in *h7*, the Director encouraged the users of the cafeteria to freely express their comments and suggestions by sending an e-mail to Franco Tosi.

No comment or suggestion was received by Franco. Is no news good news...?

## Walking or jogging in the countryside of medieval Vicopisano

**This time we shall go on foot** (one may do this tour either walking or jogging or it may well be part of a longer cycling tour).

It is a pleasant 9- km walk or run in the countryside. The first quarter is along a lightly trafficked road, while for the remaining three quarters you may meet only occasional cars. It should take about 1 hour - 1 ¼ hour at moderate jogging speed or 2 hours at a leisurely stroll. You may however wish to factor in some extra time for deviations and visits to important historical architectural works.

You would first start by reaching Vicopisano (<http://www.comune.vicopisano.pi.it/turismo/index.php>) which is a well preserved Medieval village a few km East of Pisa and North-West of Cascina.



vicopisano.pi.it/turismo/index.php) which is a well preserved Medieval village a few km East of Pisa and North-West of Cascina.

Vicopisano was once an important town controlling

the navigation and the transport of goods along the rivers Arno and Serchio.

The Serchio which flowed into the Bientina lake in medieval times before reaching the Arno river close to Vicopisano. This was also diverted from its original course so that it now flows into the sea North of Pisa.

*Left: View of the Arno at Vicopisano in the XVI century.*

*Bottom: the old (in yellow) and the new course of Arno*



	distance km	places of interest
1	0,0	Pieve di Santa Maria (XII century). Start along Via Butese (Strada to Buti)
2	0,6	Via Butese, a 2 km deviation to visit the Church of San Iacopo (XII century) .
3	1,3	Via Butese , a 1 km deviation to see the church of Sant' Andrea (XI century)
4	1,9	Leaving Via Butese
5	3,8	Along a local road (Via del Termine)
6	4,3	Cascine di Buti, Via Mazzini
7	7,8	Via Serezza along the bank of the channel until the end of the road
8	7,9	The walls of Vicopisano along Viale Brunelleschi
9	8,0	Torre del Soccorso designed by Brunelleschi (XV century)
10	8,3	Torre delle Quattro Porte (XIII century), back to Pieve Santa Maria



Both rivers flowed through here at that time. At the time of its greatest success, in the XII –XIII centuries, it had one hundred civil towers. Of these towers only nine are left after the destruction carried on by the Florentines, who conquered Vicopisano in 1406 during their wars against Pisa. The river Arno at that time flowed along its walls before being diverted in 1560 by the Granduca Cosimo I Medici to straighten and shorten the navigation routes to Florence.

**The itineray of our tour**

**1. Pieve Santa Maria in Vicopisano (starting point)**



The Pieve (Parish Church) of Santa Maria originally dedicated to Saint John the Baptist in its present form dates back to the 12th century. It was built on the ruins of a more ancient Church which finds mention in the tenth century. It is the oldest and most important church in Vicopisano area. At present its facade is being restored (<http://www.comune.vicopisa.pi.it/turismo/monumenti/chiese/index.php>).



A magnificent full-sized wood Deposition is positioned over the altar: it dates back to the beginning of the 13th

century. It is a rare example -once widespread - of this kind of sacred representation.

One would start turning right (while facing the front of the church). On the main road immediately cross a small stream and take the Via Butese (or Buti road). Follow this road for about 2 km. Along this first part there are two possible detours to visit two medieval Romanic churches: San Iacopo and Sant’Andrea.

**2. San Iacopo (0.6 km)**

When you have travelled 0.6 km on Via Butese you have the choice of a two-km deviation to visit the Church of San Iacopo (XII century). To reach it from Via Butese turn left into Via San Jacopo at the 0.8 km mark. You will find the church, partly hidden by a XIX century villa, on your right hand side on a smaller road which is about 0.2 km along the Via San Jacopo (if you get lost, please call Filippo!).

The beautiful church of San Jacopo sits above the valley of the same name and dates back to the Longbard Age. According to the inscription on the architrave of the main door, it was originally dedicated to San



Mamiliano. The church was mentioned in documents as early as the 8th century. It was part of a monastery in the 12th century and was referred to as a Priory. In the 13th century it became a possession of the Augustinian hermit Friars.

**3. Sant’Andrea (1.3 km)**

About 0.7 km past the church where the road passes through a group of about a dozen houses, you can take a 1 km detour from Via Butese along



*The access road to Sant’Andrea a road on the left to see Sant’Andrea in Nocciola (XI century).*

In Sant’Andrea in Nocciola there is a monastery church of the X-XI century. It was documented in XII century as a nunnery hosting an Abbess and up to ten nuns. Unfortunately its interior has been restructured making it a private house.

**4. Leaving Via Butese taking the local road Via del Termine (km 1.3-1.9)**

After about 2km from the start on Via Butese, you find a triple crossing. On the left the road climbs towards the village of Buti where one the “Ville Medicee” is to be found (Castel Tonini from the XVI century). On the right a perpendicular road goes towards the Serezza stream. You continue almost straight on along the well paved local road (Via del Termine).



*Farm house under Monti Pisani*

### 5. Along the local road Via del Termine (km 1.9-3.8)

This is a most agreeable part of the walk, flanking meadows populated by several pheasants.

Soon you will pass along two small ponds with geese and ducks. On the left of the road the hills of Monte Pisano begin to rise.



*The Ponds*



After about 2km, the latter part of it flanking the stream Fosso Riaccio, you find, at the end of the road, a T-crossing.

### 6. Reaching Cascine di Buti (km 3.8-4.3)

Turn right towards the village of Cascine di Buti, cross Fosso Riaccio over a small bridge and then continue along Via Mazzini in the outskirts of Cascine, slightly sloping up and then down. Via Mazzini is a village street flanked by a few houses.

Soon you reach a busy main road (Strada Regionale) that you will follow on the right for a few dozen steps across a bridge over the stream

Fosso Serezza and immediately turn right along an unevenly paved road called Via Serezza (no sign with the name at this end).

### 7. Along the Fosso Serezza stream flowing in a channel (km 4.3-7.8)

Follow Via Serezza coasting the stream Fosso Serezza, which flows inside a channel. The road at the start is very unevenly paved with lots of holes and will become unpaved and then evenly paved for less than one km and finally again unpaved, where the paved road will turn right towards Via Butese, but you will keep on straight. Via Serezza goes through open meadows and flanks for all its length the Fosso Serezza. Before the opening of the hunting season you may easily see wild rabbits, pheasants and hares along this road in the fields.

The Serezza, that was excavated at the end of the XVII century by Ximenes, is part of the channels system that was completed in the middle nineteenth century by the Granduca of Tuscany, Leopoldo II of Asburgo-Lorena to drain the marshes surrounding the Bientina lake (also called lake of Sesto) and the lake itself, that at the time filled the shallow depression, where a pond and a marsh are the only remnants of the original lake and form a protected natural reserve. In the distance you will have always in view in front of you the small hill where Vicopisano is located, dominated by the main tower of the fortress designed by Brunelleschi in the XV century (Rocca del Brunelleschi).



*Vicopisano seen from the banks of the stream, Serezza*

Finally, at its end, Via Serezza crosses a town street, Viale Vittorio Veneto, that coasts Vicopisano. Cross it and now Via Serezza becomes a narrower path along the bank of the channel. Follow this path for about 0.2 km until you find on your right an old brick bridge. Turn onto it and cross the stream to find yourself under the Torre del Soccorso in Viale Brunelleschi in Vicopisano.

#### *La Botte.*

*If you continued to follow the banks of the Serezza you would reach first where the channel enters into a larger channel (Canale Emissario or Imperiale) that was excavated to drain the Bientina lake, at the time the largest lake in Tuscany, and finally after 1.8 km the place where this latter channel passes under the river Arno in a tunnel ("La Botte") that was built in the middle XIX century by Alessandro Manetti under the Granduca Leopoldo II, a major engineering feat for that time. It was built to ensure the Arno avoided re-flooding the drained lake.*

### 8. The walls of Vicopisano along Viale Brunelleschi (km 7.8)

Viale Brunelleschi flanks the Serezza stream, on one side, and, on the other side, a remaining portion of the medieval walls of Vicopisano. In this area in medieval times the Serezza flowed inside the Arno River, before it was deviated further away from Vicopisano. Here also was the site of the medieval harbour on the Arno River that still existed in the XVI century.

### 9. Torre del Soccorso designed by Brunelleschi (km 7.9)

The "Torre del Soccorso" (Aid Tower) is an integral part of the fortifications designed by Brunelleschi. It was the tower that assured the control of the walled pathway that was an access to the Fortress; this fortified pathway had been designed as a preferential

entrance to the Fortress in the event of sieges. At the base of the tower, through a portal communicating with the banks of the Arno river, that once flowed there, one could access the fortified pathway and arrive to the beautiful Rocca (fortress) designed by Brunelleschi. In that way, the "Torre del Soccorso" allowed the soldiers barricaded inside the Fortress to receive food and new troops, in the event of riots or sieges. At present it is being restored (<http://www.comune.vicopisano.pi.it/turismo/monumenti/torri/index.php>).



### 10. Along the medieval walls of Vicopisano back to Pieve Santa Maria (km 7.9-8.6)

Now follow Via Brunelleschi on the right hand-side along the remaining portion of the ancient walls of the town and you arrive in front of one of the gates in the walls of Vicopisano. Here you will reach the Torre delle Quattro Porte or Porta di Riale (XIII century).



The "Torre delle Quattro Porte" (4-gates Tower) - as this tower is popularly called - or "Porta di Riale" is an unusual example of a medieval tower. It was both a watchtower and an entrance gate to the Castle (the only one still existing).

Follow Via Vittorio Veneto on the right, still along the walls of Vicopisano, until you reach Via Butese again, having the Pieve Santa Maria on your left, where the tour may terminate, unless you wish to visit the centre of the village with its numerous medieval buildings, including the XIII century Palazzo Pretorio and the Rocca designed in 1434 by Brunelleschi.

F. MENZINGER

## A Gray day at EGO

**Before reading this, it's worth** noting that this interview took place on Mark Gray's last day here at EGO and he was to be found in fine form. I've transcribed it almost verbatim from the recording we made, but it of course does not include the laughter, which pierced the discussion from start to finish. Just listening to it again has brought a smile to my face on many occasions. I hope that the way in which it is presented below helps to transmit some of that warmth.

GH: So...

MG: *You needed to ask me these when I'm drunk.*

GH: I know, yeah.

MG: *So that I could come up with wittier responses. Now I need to think very carefully.*

GH: Right then, so first question, Mark. On your last day at EGO, how do you feel?

MG: *Quite sad to be leaving, but excited to be starting a new job back in my home country, in Ireland.*

GH: So where will you be going exactly?

MG: *Tomorrow morning I'll be leaving and travelling across Europe by car, doing a bit of tourism in Normandy, having a look at some of the beaches there, and then getting a boat, returning back to Dublin, and then I'll be starting my new job in Shannon, in the west of Ireland.*

GH: Can you tell us a little bit about how things have changed here at EGO since you arrived?

MG: *Well, obviously the major change we have now is the new building, which is very nice, although us less important people don't get the chance to go over there that much. The big change, which has had the biggest effect on most people at EGO is the decision to stop allowing us to go to the restaurants and now we have to go to the mensa, which is nice, but we all eat in ten minutes, which is not very nice at all.*

GH: Can you tell us a little bit about what you feel that you've learnt in your time here?

MG: *I've probably learned more from a personal point of view, rather than a technical point of view. Definitely, learning Italian, learning about Italian culture, Italian people, the way Italian people work, has been a very interesting experience. A very eye-opening experience. In general seeing the kind of north-south European divide. Just how there's a major difference between how people in the south of Europe, in particular Italy, and people in the north of Europe, in countries like England and Ireland approach different problems and just their approach to life in general. It's probably better the way Italian people approach life. Irish people drink too much. Italian people drink a nice amount of wine, they enjoy themselves, you know. They don't go over the top.*

GH: What will you miss the most on leaving?

MG: *From EGO, I'll miss definitely the multi-cultural aspects of the job-*



*the opportunity to learn about different people, different countries. I'll miss speaking Italian. The challenge of working in a big multi-national environment and a big experiment like this, with cutting-edge technology and big machines and many nodes there in the Computing Centre.*

GH: Any regrets?

MG: *No, I don't think so. I'll come back to that.*

GH: Is there any single event or tale that really sticks in your memory?

MG: *There are ones, but I'd rather not say them in an interview! On a professional level there are a few things that will definitely stick in my memory. On a personal level, too many to list. Too many funny things. In particular, I just love the way that Italians can't speak English and they make a lot of mistakes, and some of the mistakes are very funny and we've had a lot of fun with that. Particularly us three who are the only native English speakers here at EGO.*

GH: Not anymore.

MG: *Not anymore, now there's Richard and Shourov, the plastic paddy.*

GH: How do you feel about the Irish passing from the majority to the minority in EGO?

MG: *Well, OK, it's not true. Now we're even as far as I understand. Martin is...*

MM: I refuse to be drawn into this!

MG: *Martin is Irish, let's face it. We joke about it, but he's as Irish as I am. OK, he's just northern Irish and I have to say that the six counties of the north are legitimately a part of the whole island of Ireland. Just because you b\*\*\*\*\* have taken them from us, doesn't mean they are not a part of Ireland. So that's one Irish. Shourov is naturalised Irish, of course, he's never been to Ireland...*

GH: I'm more Irish than Shourov!

MG: *Yeah, you probably are! And Richard Day and yourself, OK you're both English, that's true, so I think we're even. I think it's good. I mean Ireland has a good showing considering we're, in total, including the north, a country with six million people, and England has what?*

GH: Fifty-one million.

MG: *Does that include Scotland and Wales?*

GH: No, that's just England.

MG: *OK, so you have eight times more people, but you have equal representation here at EGO. As I said there should really be Italian, French, Irish and English flags out there, because there's more of us than there are Dutch. There's only Bas...*

*Hmmm, OK, any regrets? Yeah, I regret leaving Martin to fend for himself against you English b\*\*\*\*\*.*

GH: OK, any final thoughts?

MG: *I hope the experiment goes well. I hope they do eventually discover gravitational waves and I hope that that people at EGO continue working hardy (sic) in the efficient manner that they have been doing in the last ten years.*

GH: OK, thanks very much Mark.

MG: *OK, cool. It's a pleasure.*

Mark left to take up the position of Software Engineer at Intel in Shannon, in his native Ireland. A good friend to many at EGO, he will be missed.

G. HEMMING

## A new Day at EGO

**I arrived on the evening of Sunday 3<sup>rd</sup> February in Pisa.** I came accompanied by my French wife Armelle. Our 12 month old daughter Leonore was to follow on later in

the week with her grandparents from Grenoble. We both breathed a sigh of relief on arriving in Pisa as we had travelled from Paris, where we were living, down to Grenoble and then on to Pisa; all that in our clapped out Peugeot 309. We weren't sure if our old faithful French car was going to make it, and frankly, our Italian wasn't up to calling out the breakdown service.

Our new adventure in Italy had started!

The following day was my first day at EGO working as an Optical Physicist in the Optics group. It's an enormous change from my previous job. I was working for six years in Paris for a company called Trimble Navigation. This company is well known for their positioning solutions such as GPS and Total Stations used by surveyors. I was working as an R&D engineer for an emerging technology called 3D laser scanning which, by using the pulsed time-of-flight distance measurement technique, allows us to capture in 3D large objects like buildings, bridges and even mountains (<http://www.trimble.com/trimblegx.shtml>).

There were many reasons for us to want to move to Italy and for me to want to work at EGO.

### PERSONNEL MOVEMENTS EGO STAFF

#### Arrivals

*Richard Day*  
Optical Engineer  
in the Optics group

*Giuseppe Di Biase*  
UNIX System Administrator  
in the Computing department

#### Departure

*Mark Gray*  
System Engineer  
in the Computing department



Armelle, who was working as a personal assistant for BNP Paribas in Paris, took a sabbatical to look after Leonore. It was therefore the perfect time for us to move on. Moving to Italy would give us an opportunity to learn a new culture and language and to maybe have some decent weather (Parisian weather isn't much better than English weather!). I was attracted by the international working environment of EGO which I find to be very enriching. I felt that working as an optical physicist at EGO would allow me to be in a research environment in-keeping with my formal education; I got an MSci degree in Physics at Imperial College, London and before working at Trimble I did a PhD in Grenoble working on a high sensitivity laser detection technique for imaging. My time in Grenoble was precious as it is where I learnt to speak French, ski, appreciate good food and is where I met Armelle.

So, here we are four months on. We have a wonderful rented house in the centre of Pisa. Leonore has taken to Italian life like a duck to water, probably speaks better Italian than I do, and seems to enjoy having her cheeks pinched by passing Italian women. I am enjoying working at EGO. Everybody has been extremely welcoming and we have had a lot of help from a lot of people. The work is challenging and I still have a lot to learn, but I am looking forward to making my contribution to the glorious day when we see that little wave.

RICHARD DAY

## GOOD NEWS!

Welcome to **Lorenzo**, born March 15th 2008 at 17:22 and our congratulations to Luca and Francesca Paoli!



One of the h-team members married.

Our best wishes to **Flavio and Maruska Nocera** whose wedding was on the 23rd of April 2008!

## Lost and Found

This 200 Lire coin has been found inside the oven of the West Input tower, during the preparatory works for the Thermal Compensation System (TCS). The owner, after duly proving his right to it, can have it back. A 10% reward, about 0.01 €, is due to the founder, Carlo Fabozzi.

