NASCENT Newsletter

Nanomaterials for Application in Sensors, Catalysis and Emerging Technologies

MIP Modeling and Sensors Workshop



NASCENT researchers met again for a workshop held at Cranfield University, Silsoe, UK. During the course on MIP Modelling and Sensors, the group learned about theoretical background of modelling functional monomer-template interaction and they did some practical tasks using the program SYBYL. The team also visited laboratories working on sensor development. They had a pleasant time with colleagues from Cranfield University who took them to the local restaurants and pubs.





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Researchers' comments on workshop

A new way of looking at things

Starting with the trip: me and Tristan left Jena at around 12.00 noon and after a 3 hour trip by train, we waited about one and a half hour at the airport before boarding the plane for a two hour flight. Afterwards, we took the wrong way to Silsoe, following the instructions of the man who was at the National Railway Services counter (how friendly of him...). So we went all the way to Bedford, only to find out later that Silsoe had been left half way.

After the long journey, a time for meeting "old" friends was in order: following the instructions of the Workshop Coordinator, Dr. Kal Karim, our dinner was served at the nearest pub (I don't remember the name...). The night was not very long, since everybody was somewhat tired because of the travel and the pub closed early.

The first day of the course was presented by Dr. Kal Karim, with some of the basic, but nevertheless, extremely essential aspects of molecular modelling. By establishing a perfect transition from the lectures to the practical sessions, Dr. Karim explained the importance of the minimization of a molecule's energy in order to obtain the correct final MIP properties. This whole process of modelling was made using special software developed at Cranfield University.

At night, it was time to enjoy a slightly spicy meal (and by this, I mean VERY



VERY HOT!!!) at the Cranfield's Group favourite Indian restaurant, following by some wine drinking at the Silsoe Conference Centre to catch up on the latest news within the NASCENT researchers.

During the second day and through a small "quiz/test", we were able to understand the influence of some of the parameters embedded in the software when minimizing the energy of a given target template. The lecture given by Prof. Piletsky was, at the same time, motivating and a bit alarming, showing us the honest vision on the future of MIPs, advantages and disadvantages, possible applications in medicine and

industry, basically what can we expect to achieve successfully in the near and far future using MIPs.

The demonstrations given by the Cranfield research group on the afternoon were very inspiring, giving us an insight on some of the techniques and research methods that are there used. I was particularly delighted at the part given by Dr. Michael Whitcombe, who showed us the functioning of a basic SPR apparatus, since we, at Jena, have a new co-worker that will start his research soon within this field.

In the evening, the gathering took place once more at the local pub, where we ended up having a long chat with the pub owner. The party went on afterwards with wine, music, dancing and talking once again at "our" lounge, in the Silsoe Conference Centre.

Unfortunately, I wasn't present in the last day's lectures and discussions, since I had to take my flight home quite early, so I will leave that part for someone else to tell.

Looking back at the time spent in Silsoe Campus, I must say it was interesting to see such a heterogeneous but at the same time, very cheerful and dedicated research group and I will surely inform all the people I know who might have an interest on this field, that it's a very good place to confirm your ideas and theories through modelling and also to get some new ideas to work on ahead.

LONG LIVE PUNKY!





A computational approach

On 23rd of January I met the other NAS-CENT researchers in Silsoe, England, to attend a MIP modelling course. This workshop was held at the University of Cranfield and Dr Kal Karim was the organizer. We had already had an introduction about molecular modelling applied to imprinted polymers during the first NAS-CENT summer school, and I was very eager to deepen this topic. In these two and a half days we saw how it is possible to develop MIPs using a computational approach and what promising technologies are available to implement MIP based sensors.

In the first part of the course, we saw which software is used to model the template and the monomers molecules, how we can choose the monomers with best



Whitcombe and Dimitris Kyprianou showed us their research on MIP sensors based on SPR.



affinity to the template and how it is possible to find the best ratio between the moles of components. Also in this first course part, we had also a practical workshop where we were able to draw our templates and screen them against a library of functional monomers. Since the background of this course wasn't purely physical-chemical based, we focused mainly in the correct input of the molecules inside the software and how changing the theoretical models available into the software can change the final result.

In the second part of the course, we had a very nice introduction to MIPs sensors by Professor Sergey Piletsky and then we took a tour of the laboratories where they were developing those MIPs sensors. Dr Iva Chianella showed us her piezoelectric sensors and Dr Mike

In the last morning at Silsoe, we had a brief introduction by Dr Kal Karim about chemoinformatics. He showed us how many ways exist to represent a molecule inside a computer and then we learnt the difficulties related to search a compound, or part of it, inside a database.

I found the workshop very interesting and well organized, even if it lasted only few days. Looking back, it was also a good opportunity to see the cheerful town of Silsoe, lost in the England countryside. It deserve a particular mention for the pub where we usually went to have dinner, the Star and Garter Pub, a typical English style pub inside an old cottage where it was just delightful to spend the evening with a beer and some friends.

I was happy to have met the Cranfield research group; they are a wonderful

team, funny and helpful. We spent a nice evening in an Indian restaurant and thanks to Dr Dhana Lakshmi, our network found our new mascot: Punky! This queer penguin will soon take a tour of Europe, stopping in every laboratory of the NASCENT network and he (or she) is also ready for the intercontinental trip to Japan!

After the end of the course, I had the chance to stay two days in London as a tourist. I visited a lot of things that I couldn't see before like Hyde Park, Buckingham Palace and Soho by night. Then, together with my colleague Tristan, we went to see the famous street market of Portobello Road and we had a little glimpse of the Science Museum. Mandatory stop was also the Chemistry department of the Imperial College of London, a mecca for every scientist.

In the end, I think that the Cranfield workshop was a very good event, not only from the scientific point of view but also because it firms up the friendship between network researchers. I'm waiting impatiently for the next meeting!





Kodak Workshop on Innovation and other events

By Aurelien

I left Madrid, Saturday the 26th of January for a very last and special secondment, which was going to bring me to meet many people and places, gain experience from Industry as well as academia. Thus, since I was back in good old England as my first stop, I decided to go up to Norwich, in East Anglia, the place where I achieved my PhD. There, I met my PhD supervisor, and I told him about my experience and the opportunities I got working within the NASCENT European network.

On Sunday, after a pint of CHB (Chalk Hill Bitter), I left and took the train to Cambridge to have dinner and meet my NASCENT postdoc colleagues: Silvia, Jan, Kevin, Tristan and the new guy Tomas.

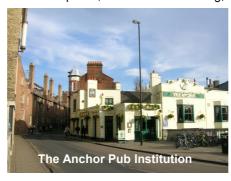


On Monday morning, we left early to reach the Kodak Research Centre and Stéphanie who was waiting for us. We got introduced by Stéphanie to different people in order to get an idea of the work place. The workshops were dealing with topics such as Innovation, Technical Intelligence, View from SME, Intellectual Property, The Patenting Process. The best for me was the Creativity Session, which was an interesting experience and allowed us to interact with other researchers from the Kodak Centre. I think Stéphanie did a stunning job





to organise so many lectures in such a short time. Thanks, and the accommodation was nice too. In the evenings, we had dinner at St Catharine's College, that was special, and the last evening,



we went to the pub, and I personally enjoyed a couple of Adnams with my colleagues as well as the NASCENT mascot: Punky!!!

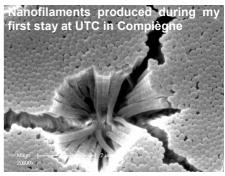


But then came Wednesday early morning, time to leave for France, where I was going to join Karsten Haupt's



group, in order to finish some work and take some samples that I had made during my 3 weeks stay in December. Therefore, with the help of Ana, I managed to synthesise some nanofilaments.

that was a nice experience, since I had no experience in that field of nanostuctural chemistry. I produced some more oxides so that I could bring them back to



Madrid and reproduce some work, and achieve more nanofilament polymers. I have to say that it was nice to see the people of Compiègne again, Karsten, Ana and Arnaud made me feel welcome again. I even met Ania from Marina's group in London, and we had what I would call: "A brainstorming session on interactions between monomer and template". It was nice to talk with you guys.

Eventually, on Wednesday the 6th of February, I went to visit Polyintell in Rouen, in order to get a scientific view from a small company, after the one I got from Kodak. So I went to meet with Sami Bayoudh and the researchers of Polyintell, getting information and asking questions to many people. I was really well received, and we even had time for me to do a small presentation which allowed me to update them with my recent progresses in the field of MIPs and the synthesis of nanofilaments. Polytintell is small, but it seems that they are very productive and will grow bigger in the coming years. They have big potential. Finally, I went back to Compiègne in the afternoon, had dinner with the people



On Thursday 7th February I eventually made it home, back to Madrid!!! I was so tired, but my adventure was not finished yet, since the next day, I wanted to join my colleagues from Madrid to Alcalá de Henares for the second Futursen International Workshop dealing with Advanced Biosen-

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sors for Water Analysis (www.ucm.es/info/futursen). Prof. Guillermo Orellana was in charged of the organisation. We had presentations by Prof. Liedberg from Linköping, Sweden, Dr. Mignani from Florence, Italy, Dr. Eickhoff from Munich, Germany, followed by some presentations of local scientists.

Basically, I had 2 crazy weeks of secondment, but I enjoyed it a lot. Special thanks to Stéphanie for organising the Kodak workshops, Karsten for allowing me to spend more time in his lab, Ana and Arnaud for taking care of me



in Compiègne, Sami Bayoudh to allow me to visit Polyintell facilities, and NASCENT for giving me the opportunity to do this secondment. Thanks for everyone involved in NASCENT for making my postdoc year such a good experience, it was worth it.

Photos by Silvia, Tomas and Aurélien

Colleges of the University of Cambridge



St John's College











More photos and presentations from this workshop have been added to the NASCENT intranet.



Having been asked to write an article about the Venice Carnival for the NAS-CENT newsletter, I was initially afraid to write something sounding like an advertisement for NASCENT researchers to plan a secondment in Padova (36 Km west of Venice, with very good connections to the region capital). After all, Venice does not need much advertising, and even without this article there have already been a number of ESRs visiting us...

Therefore, I will start with a warning: depending on your personal attitudes, the Carnival period can well be the best or the worst time of the year to come to Venice. If you are interested in sightseeing, visiting museums, monuments and churches and enjoying in full the quiet, intriguing atmosphere of this ancient city. then it is highly advisable to choose another, less crowded period. If on the contrary you are interested in experiencing lots of people, events, music, dancing and a hint of craziness (though only a pale reflection of what it used to be in the good old times) then OK, in that period the residences for foreign visiting researchers in Padova surely have vacancies!

Today's Carnival is a little like it used to be in the past. Nevertheless, in order to understand this feast and its rituals, it is unavoidable to have a look at its history. The development of the Carnival tradition is in fact the result of evolution and integration of several historic events over the course of centuries.

First of all, concerning the historical and philological interpretation of the word "carnival" there are two hypotheses. The first hypothesis relates the "carnival" to the latin term "carrus navalis", which identifies procession carts in the shape of ships, used in ancient Rome during purification rituals (usually in February, the last month of the roman calendar year). The second and at present more widely followed hypothesis is related to the latin term "carnem levare" (to take out meat) which refers to the ancient medieval tradition of celebrating, after a long period of feast and entertainment, a party of goodbye to meat during Ash-Wednesday, before the Lent fastings.

Independently of which explanation is the right one, both bring out the fact that in

that period celebrations were usual even in very ancient times. Indeed, it seems that in Venice the "Carnival" was already celebrated in the tenth century, when Doge Vitale Faliero mentioned it for the first time in some official documents. Later on, more reasons for party-making in this period were added by Venetian majors, when the celebration for the victory of doge Vitale Michiel II on patriarch Ulrico in Aquileia in the year 1162 was established on Carnival Thursday. The war between Venice and patriarch Ulrico, a devotee of the emperor, started on account of a bill from Pope Adrian IV giving the whole of Dalmatia to the Patriarchy of Grado. Taking advantage of the ongoing war between Venice and Padua and Ferrara, Ulrico, with the aid of feudal vassals from Carinzia and Friuli, attacked the city of Grado, forcing the flight of the patriarch Enrico Dandolo, a Venice ally. Doge Vitale Michiel II promptly responded by sending the powerful Venetian fleet to Grado, which utterly routed the poor patriarch Ulrico and the 12 rebel feudal vassals. Through the Pope intercession, they were released after having been taken to Venice, but in exchange Venice asked the patriarch of Aquileia to send a bull and 12 well-fed pigs (does anybody see a relation with the defeated?) every year for Carnival Thursday. The animals were received as prisoners in the Ducal palace, put in wooden reconstructions of the Friuli castles and finally slaughtered for the whole of the Venetian people. The bull was slaughtered last, after a cruel bullfight usually held in the courtyard of Ducal palace. The Italian expression "tagliare la testa al toro" (to cut off the bull's head) meaning to put a final definitive end to a problem. arose in that times since when the bull's head was cut off, the show was over.

This tradition was abolished in 1420 when Friuli came under the power of Venice and there was no longer a rich Patriarch to pay for the bull and pigs. The feast however survived, and it was transformed into a harmless game, which lasted until the end of the Republic. Carnival Thursday was meanwhile established as one of the most important days in the carnival period, and other shows took place on that day, for example with the acrobat exploits of tightrope walkers. Among those, the most famous is the so-called "flight of the Turk"- This may sound somewhat anti-islamist, but indeed

this show was held for the first time in 1548 by a Turkish tightrope walker (hence the name), who, with his pole in his hand, walked up a rope from a boat in St Mark's bay right up to the belfry of St Mark's church. It was an astounding act and the Venetian people were so struck by it that it became a fixed event on Carnival Thursday. In the following years the "flight" was always carried out by professional acrobats. Through the years, it became an official ceremony divided into which the so-called three steps. "Turk" (also called "Angel" because of the wings he had to wear) had to perform, although with possible variations:

- 1. walk on a rope up to the top of the belltower:
- 2.come down performing somersaults to the loggia of the Doge's palace where the Doge, together with foreign ambassadors and politicians, would give him flowers or cards with poems;
- walk back up to the top of the belltower.

The Doge would often give the "Turk" some money instead of flowers, a variation of the standard protocol which was usually quite appreciated by the main actor of the event.

Of course, there were also accidents every now and then, like in 1759 when the "Turk" fell to the ground among the horrified crowd. These accidents were the reason why the acrobat was finally dismissed in favor of a big wooden dove ("colombina") containing flowers and confetti to sprinkle on the on looking crowd during its descent from the belfry of St Mark's church. This is how the Flight of the Turk became the Flight of the Dove. In today's Carnival, this tradition has been kept, although the flight takes place on a different day, namely at the outset of the Carnival celebration, 12 days before Ash-Wednesday. Moreover. the higher security standards that have been achieved in modern times have made it possible to replace the wooden dove back with a human being. He or she is usually an Italian celebrity (usually from sport, television, cinema etc.) that accepts to make a rather comfortable descent from the belfry of St Mark's church dressed up like an angel and sprinkling as the wooden dove did confetti on the crowd.

Of course, carnival Thursday was not the

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only celebration day in ancient Carnival. During the long time in which Venice was an independent republic "Serenissima") the celebrations lasted six weeks, from the 26th December to Shrove Tuesday when the end of Carnival announced the beginning of the Lent. The importance of Shrove Tuesday, mardi gras, was marked in 1296 when it was declared a holiday by the Senate of Venice. Indeed, although there were many and varied festivities that Venetians were only too keen to participate in during Carnival time, such as bullfights (see above), cart-racing, never-ending costume parties in the most beautiful buildings in Venice, or the obligatory walk (the "liston") to show off the best masks in the city, the greatest acts of lunacy were saved for the last day of carnival the wildest and happiest of the whole carnival period. At the heart of festivities was St. Mark's - a veritable orgy as witnesses of the time describe it. There was much singing and dancing in the general mayhem in St. Mark's which left people exhausted and gasping for breath. The partying wasn't just in St. Mark's but went on throughout the whole city. Thousands of masqueraders ran amok thought the streets and squares with torches lighting up the whole town. An enormous effigy wearing Pantaloon's mask was put between the two columns in the Square and then burnt while the crowd chanted "It's going, it's going, the carnival is going!" as the bells of San Francesco della Vigna tolled slowly and mournfully signifying the end of Carnival and the beginning of Lent. A vestige of this program is also maintained in today's Carnival, with a big fireworks show in front St. Mark's square marking the end of the celebrations.

The symbol of Venice Carnival is un-



Masks in a XVIII century painting by Pietro Longhi.

doubtedly the mask. The mask in the city of Venice has ancient origins and was used throughout the Carnival period and often even outside of it. Indeed, during all major events, such as official banquets or other celebrations of the Serenissima Republic, the wearing of "mask and cloak" were permitted.

The official permission to wear masks during Carnival had a very important social meaning, in that behind it any social difference was temporarily abolished and people of widely different origin and status could mix up and have a good time together. In this connection, it has been also argued that Carnival was also a mean of rigid control over human compulsions to water down social tensions and maintain consensus. In fact in the strictly hierarchical Venetian society, it was helpful to give the most humble classes the illusion of becoming similar to the more powerful, even if it was only a gracious concession for a prescribed period of time. Indeed, this habit was encouraged and extensively exploited by Venetians: for example, rich people did not wear expensive robes together with the mask, which would have made them but the inexpensive recognizable, "tabarro" (a dark, heavy woollen cloak). Things went so far that, for example, in the XVIII century it was a norm of good education whenever meeting masked people to make salutations such as "good evening, Mrs. Mask!" (mask is feminine in Italian), since it was impossible to state whether the mask person



was a nobleman or a humbleman.

On the basis of the above, it may become clear that the masks that were employed in those days were usually not reproducing a character (e.g. Pantaloon or Harlequin or, in modern times, Spiderman, Mickey Mouse or G.W. Bush...) or a state of mind (e.g. the masks in the ancient Greek theatre) but were simply a disguise. Therefore, they were usually inexpressive, anonymous, and functional, in that they were constructed with the aim of allowing the wearer to eat and drink and talk easily, but with a slightly tarnished voice. The most common example of such a mask is the so-called "bauta" (see below).



Some examples of "bauta"

The Carnival-mania in ancient Venice reached its peak during the XVIII century, when the city's Carnival parties, entertainments, masks, theatres and gambling houses ("ridotti") became tourist attractions for the whole of Europe, and especially for the aristocrats en route to the so-called "Grand Tour" of Europe. Consequently, Venice began to welcome thousands of visitors eager to experience its extremely unusual and effervescent atmosphere. During this period Carnival lasted several months (its unofficial beginning was anticipated to October!), thus contributing to the creation of the myth of Venice as a city of pleasure and enjoyment, which sort of compensated its contemporary political and economic decadence. In those years, the Carnival was not only a tradition to keep alive, but also a relevant source of income for the city (as you see, Venice started to live on tourism many years ago). Consequently, the show could not be interrupted: most notably, the death of doge Paolo Renier, which happened on February 13th 1789, was announced only on March 2nd, at the end of all receptions and parties.

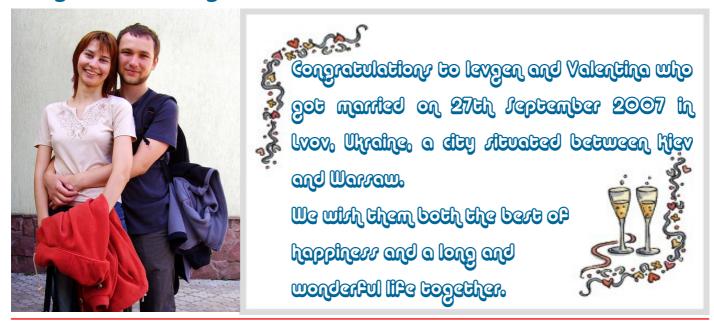
The Serenissima Republic fell to the French led by Napoleon in 1797 and Venice soon thereafter merged into Austria as a consequence of the Treaty of Campoformido. Under Austrian rule, a lot of traditions were forbidden or strongly limited (Austrians are a damned serious people....ops, sorry Gerhard!). The tradition of Carnival parties continued only in private palaces and houses until 1861, when Venice became part of the nascent Italian state, and also afterwards, but notes about Carnival celebrations became rarer and rarer and, remarkably, they were limited to private events.

Finally, starting form 1979, many associations in Venice decided to relaunch the lost Carnival tradition. Today several institutions plan and promote working with other authorities the Carnival organisation and activities in downtown Venice in the 12 days before Lent. The Municipality choose every year a central idea taken from various cultural or showbiz themes. This year it was "the six senses", as the six Venice quarters (sestieri). The sixth sense is considered to be....the imagination! Several events take place throughout the city. from Carnival feasts and masked balls in private palaces to people in masks who happily invade streets and squares in search of fun...will you be next year among them.

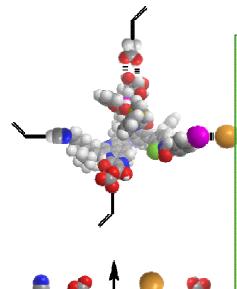
News... News... News...



Ievgen's wedding



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Recruitment

Dr Maria Moreno-Bondi's lab at UCM is looking for another ESR to start on 1st May 2008. The job advertisement can be found on both NASCENT and the Commission website. Please advertise this position widely within your Institution and with your colleagues.

Professor Kutner informed us that the recruitment procedure for his ER, Subramanian Satish, is almost complete. Subramanian arrived at IPC lab in February.

Presentations

Ania Servant and Rita Jorge presented their posters at the "Postgraduate Research Symposium, Posters by 2nd year postgraduate students" held at the School of Biology and Chemical Sciences Ania's poster was on "Development of novel imprinted nanogels with catalytic activity for the kemp elimination" and Rita's was on "A molecular imprinting approach towards the catalysis of phosphate hydrolysis". The latter was also presented at the RSC UK Macrocyclic and Supramolecular Chemistry Group Meeting on 18th - 19th December 2007 at the School of Chemistry, University of Manchester.

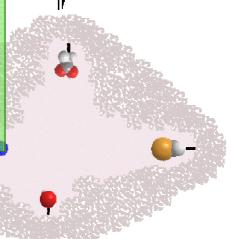
Professor Kutner was invited by Professor Patrizia Mussini of the Department of Physical Chemistry and Electrochemistry of the University of Milan (Italy) to give a threeday short course at her department, for PhD students on February 13 through 15, 2008. The six lectures given over three day were entitled: "Investigation of electrified interfaces with the use of an electrochemical quartz crystal microbalance".

Secondment

Aurelien Auger visited professor Karsten Haupt's lab for one week from 30th January until 7th February 2008. He also spend one day at POLYINTELL on 8th February 2008 were he was introduced to the researchers and work of the company and did a presentation of his NAS-CENT's activities.

Gita Dvorakova will be going to Jena from 26th March to 16th April 2008.

Artur Moro will spend three weeks at Queen Mary, University of London in April 2008.



Researchers... Coming and Going

People are always on the move and NASCENT welcomes **Tomas Martan**.



ER, who has started his employment at CiS in December 2007. Tomas has already met all the ER from the Network at the Kodak Workshop on Innovation last January.



Frank Pithan finished his training in October 2007.



Tristan Doussineau's training period with NASCENT ended in February 2008. However, Tristan was successful in securing another source of funding also from the EU (successful application in the Marie Cu-

rie Intra European Fellowship call of proposals) and will be able to stay at FSU's lab in Jena for two more years. His research will be focused on the preparation of silica optical nanosensor able to absorb and re-emit light in the near-infrared range of wavelength.



Aurelien Auger also ended his training in February. Aurelien has applied for a postdoc position at the CEA (LITEN) with Dr. Poncelet in Grenoble. He also have an interview scheduled with a Dutch company, Syncom

b.v., in Gronigen, The Netherlands, on the 27th March 2008. The NASCENT Team wishes him good luck and a bright future.



NASCENT sadly said good bye to **Sofia Martins**, ESR at UCM, on 31st January 2008. Sofia terminated her contract earlier than expected for personal reasons. We wish her all the best of luck for her future career.

NASCENT

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Please send all your news and photos to the NASCENT Administrator: s.fritche@qmul.ac.uk



Compiegne



Second NASCENT Summer School and International Meeting

These events are organized by Professor Karsten Haupt and will be held in France from 20th to 30th July 2008.

The Second NASCENT Summer School will be held at the Centre National de Recherche Scientifique (CNRS), University of Technology, Compiegne, France from 21st to 25th July 2008. All ERs and ESRs should arrive at the latest in the evening of Sunday 20th July. Hotel rooms have been reserved for six night from 20th to 26th July. The programme can be found on the NASCENT Intranet.

Researchers attending the Summer School will have the fantastic opportunity to spend

the weekend in Paris before the start of the International Meeting.

The Second NASCENT International Meeting will be held from 28th to 30th July 2008 in France. Rooms will be booked from Sunday 27th July and all PI are required to attend a pre-meeting in the late afternoon-evening of Sunday 27th July.

On Monday 28th July the Mid Term review meeting will take place with the presence of a representative of the European Committee.

Details of the hotels and venues for both events will be communicated at a later date.



NASCENT ER and
ESR are proud to
present their
new mascot,
Punky the Imprinted penguin.



Punky is currencly in Padova
and will visit all
NASCENT labs and
actend worldwide
conferences

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