

Summit feelings

by AGOSTINO DA POLENZA

Bringing back the sense of elevation, the feeling of reaching a summit, of a 360 degrees view. The High Summit is all of this applied to the scientific research, the knowledge of mountains and the development and well being of the people who inhabit them. Sounds like a challenging program? Perhaps so, but when it comes to mountains, we at EvK2Cnr are ambitious, possibly even cheeky. But we do have a few reasons to pride ourselves with. For more than 25 years we have been climbing mountains, seeing them as a source for knowledge, an opportunity for scientific research, a place where man and nature can learn how to enter into a challenging but highly fruitful mutual relationship. We also do it because it is pleasant and we like it. We have developed awareness and knowledge both in the management of complex logistics and organizational systems, and also in the engineering of the structures, equipment and instrumentation used in the mountains. The Pyramid Laboratory-Observatory on Everest is at the core of our system. Climatic examinations and consequent changes and adjustments, mitigation plans for their effects. Medicine, physiology, preventive measures and treatments for high altitu-

de pathologies - in areas where there are not only mountaineers, but also locals working every day. Deep ice core drillings on glaciers, on the silt beds of high altitude lakes for paleontological research, for muscle, heart and brain fatigue, their adaptation to the lack of oxygen in order to understand not only the adjusting mechanisms, but also why and how cancerous cells interact with hypoxia, or why free radicals behave differently amongst the various peoples living at high altitudes. How much water is available in the vast terrestrial glacial deposits of the planet (i.e. glaciers), and for how long will it be available? What are the right policies to increase the number and quality of forests. Culture, craftsmanship and art are the historical heritage of human intelligence in the mountains as well. Such heritage must be protected and valued as a resource - even an economic one, if you think of tourism, for example. This is what we have been working on for more than 25 years. There is about one hundred of us: a group of people who love mountains and the countries where they are located, Nepal for example, but also Italy, France, Pakistan, Uganda, Chile. We are happy and proud if it.

Mountain and climate change

Where the warming hurts more

by SARA SOTTOCORNOLA



Ice cave, Gore (Photo: Marcello Alborghetti)

In the last 50 years the global mean temperature has risen by half a degree.

In the Alpine region though, it has increased more: somewhere by one degree and at higher altitudes by almost one and a half degrees. These estimates are what the most authoritative European climatic models show, to which scientists and governments alike are trying to find answers, also in light of a further warming in future decades. Is this the same old climate warning? Not at all.

Let's try and focus on the mountain environment, an ecosystem that surrounds us and is part of our lives, whether we realize it or not. After all - and as trivial as it may sound - water is at the centre of the issue and our livelihood depends on it like nothing else.

The signs of climate change on mountains are plain for everyone to see.

Glaciers retreating, avalanches, serac collapses, floods, landslides and slope instability. In the last 15 years an increase in extreme weather events has been reported, both

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Fifth IPCC report

Is mankind the major cause of climate change?

Ice cover halved and more frequent heat waves to come in the upcoming decades

by VERONICA ULIVIERI

"It is highly likely that human activity is the major cause of the global warming observed since 1950." The first part of the fifth IPCC (Intergovernmental Panel on Climate Change) report on climate change (AR5), made public at the beginning of Octo-

ber, leaves little room for doubt on the underlying causes of this phenomenon that scientists, politicians and the general public have been talking about - and worrying about - for decades.

"The past three decades have

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Roped together: Lecco for the mountains

After being nominated "Alpine Town of the Year 2013" by the Alpine Convention international committee, Lecco was the obvious choice to host the 2013 High Summit. As the fifth Italian city to be awarded the title since it was established in 1997, Lecco succeeds Annecy (France), based on the city's strong environmental friendliness and its sustainable development policies in mountain areas. (On page 11-12)

Climate is changing...
.....even on your
mountains

Events in Lecco

- Multimedia Pyramid EVK2CNR-COBAT**
Videos on the effects of climate change
October 3-27, Piazza Cermenati
- Mountains and Climate Change**
International Scientific Conference
October 23 - 24 - 25, Politecnico - Polo territoriale di Lecco
- Breathing Himalaya**
A hypermedia exhibit between nature and science
October 3-27, Palazzo delle Paure, Piazza Cermenati
- Science to the streets**
A box for the analysis of air quality
October 23 - 24 - 25, Politecnico - Polo territoriale di Lecco
- Ragni di Lecco**
Film exhibition
October 22, at 21.00, Auditorium Chamber of Commerce
- Mountain Happy hour**
Only 1 euro: take the voucher at the High Summit info-point
October 24, 18.00 - 21.00 Piazza XX Settembre
- Mountain Voices**
Evening show
October 24, at 21.00, Teatro Sociale

High Summit
LECCO 2013

Why the High Summit?

by SARA SOTTOCORNOLA

The name draws its inspiration from the International Year of Mountains 2002, when a global videoconference, for the first time, gathered together researchers and politicians from all continents, with the aim of defining common development strategies. Ten years

later, mountains, "sentinels of climate change", have finally become a "hot topic" on international agendas, thanks also to the official recognition given by the final report of the Rio+20 UN summit, which defined them as "essential for global sustainable deve-

lopment, particularly vulnerable to climate change and natural disasters", and invited governments to the implementation of policies which are specific to these areas. High Summit 2013 represents a unique opportunity to take stock of the situation.



Politecnico di Milano Nuovo Polo territoriale di Lecco

From Martin Beniston to Gaetano Leone

Gathered together the most authoritative voices of international research

The High Summit scientific conference will have as guests some of the most prominent world mountain and climate change experts, from research centers and other institutions. Among them, Martin Beniston, from the Institute for Environmental Sciences of the University of Geneva, who will chair the session devoted to climate, and Gaetano Leone, Deputy Secretary of IPCC, entrusted with the task of expressing the summit's final remarks. Outstanding representatives of the scientific world will make the opening remarks: Luigi Nicolais, President of the Italian National Research Council (Consiglio Nazionale delle Ricerche), Surendra Shrestha, Director of UNEP's Environmental Technology Center, Deon Terblanche, Director of the Atmospheric Research and Environment branch of the World Meteorological Organi-

zation, Barbara Ryan, Director of the Group on Earth Observations Secretariat and Surendra Raj Kafle, Vice Chancellor of the Nepal Academy of Science and Technology (NAST). Researchers coming from all over the world will take turns at the 6 round tables devoted to Climate, Cryosphere, Water, Mountain Parks, Economic and Environmental Impacts of Climate Change. On the last day, the High Summit will focus on the Alpine Convention, an international treaty aimed at promoting the sustainable development of the Alpine region, presided over by Italy in 2013-2014. Expo 2015 is another subject which will be dealt with on the 25th October, going into the details of the role of mountains within the framework of the Universal Exposition in Milan, devoted to the theme "Feeding the planet".

(B.C)

The role of research

Climate change is basically an increase in uncertainty. Scientific research, with status quo data and predictive models, is essential in defining international strategies and actions. Studying mountains and the changes occurring at high altitudes is no easy task. Logistic as well as physical difficulties are obvious, nevertheless the data that can be collected in such locations are key to make predictions and understand future developments. Thankfully, there are people who for decades have been committed in this field with tireless dedication and perseverance, like the EvK2Cnr Committee. "The mountain issue has to become a priority in development agendas, and it needs to be the subject of scientific, political and economic debates," says Agostino Da Polenza, President of the Committee. "The High Summit conference is the result of these considerations and an attempt to address those needs."

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Where the warming...

In terms of intensity and frequency. This causes damage to agriculture, water supplies, ski resorts, electric power and as a result whole villages have been abandoned by now. It is increasingly difficult to live, work and run economies in mountain areas. This highly biodiverse and fascinating ecosystem is, on the other hand, a fragile one too, and needs protection. Financial returns are meager perhaps, but our economy depends on mountains all the same, and often politics fails at recognizing this.

Now it is time to start caring about it. Each and every one of us. This is the message sent by the High Summit, the major event supported by EvK2Cnr, in cooperation with the Chamber of Commerce, the Municipality of Lecco and Mi-

lan Polytechnic's local academic campus. At its core will be a large international scientific conference, which from the 23rd-25th October will host world-class luminaries on mountain and climate research, and which will produce a summarizing document to be submitted to the United Nations on the occasion of the COP19 in Warsaw (United Nations Framework Convention on Climate Change). And all of this will be surrounded by a variety of events to draw everyone's attention. Because mountains affect all of us, even those who do not have any direct experience of them.

been increasingly warmer. Each preceding decade since 1850 recorded lower temperatures," scientists claim. "The atmosphere and the oceans have warmed up, the amount of snow and ice has decreased, the global mean sea level has increased and greenhouse gases concentrations have also increased," said Qin Dahe, co-Chair of the IPCC Working Group I. "Severe and long-lasting reductions of greenhouse gases are necessary in order to contain climate change," added co-chair Thomas Stocker.

The report includes four different scenarios that consider a temperature rise - for the period 2081-2100, and relative to the period 1986-2005 - of 0.3-1.7°C in the most optimistic case, and of 2.6-

4.8°C in the worst-case scenario. "It is almost certain that with the rise in global mean temperatures there will be an increase of extreme heat peaks and a decrease in cold peaks in most areas, both daily and seasonal ones. It is highly likely that there will be an increased frequency and duration of heat waves.

Occasionally, cold winters will continue to occur," some scientists add. In the Northern Hemisphere, the spring snow cover surface will also decrease by 7-25% from now until the end of the century. If the sea level will continue to rise in the upcoming decades (by 0.52-0.98 m in the worst-case scenario), climate change will also affect the carbon cycle and therefore increase CO2 levels in the atmosphere.

"We are in it together, for better or worse"

Polluted air on the mountains as in the city?

by VALENTINA D'ANGELLA



Pollutants in the Khumbu Valley, Nepal



Grignetta (Photo: Marco Caccia)

Technically they are called aerosols. On the newspapers, however, we often read about PM10 or PM2.5. As a matter of fact, this is particulate matter polluting the air we breathe and resulting in dire consequences for human health, climate, glaciers and unique ecosystems of the world. They can be natural or man-made and, no matter where they are emitted, pollution has no boundaries and what we introduce in the atmosphere in big cities inevitably reaches unblemished places such as high altitude mountain areas. Our behavior affects climate even from a distance, which is why pollution is a global issue: we are in it together, for better or worse.

When we talk about fine particulate matter, we refer to particles that can be solid or liquid, existing in nature or man-made. Marine aerosol, volcanic ash and desert sand are particles that originate spontaneously in nature: they are transported by winds and we find them deposited on car windshields in cities and even in mountain areas, on the Alps as well as in the Himalayan region, where they give a dark, brownish or reddish nuance to ice and snow. Particulate matter created by human activities, on the other hand, derives from urban and non urban traffic, industrial processes, heating systems or from the combustion of biomasses, as it happens particularly in developing

countries, where people burn firewood in their houses for cooking and heating. Carbonaceous particles released in a room by cooking or heating fires, from open braziers, not equipped with chimneys, cause extremely serious damage to human health, including chronic obstructive pulmonary disease (COPD) and other cardiovascular pathologies.

"We really have to understand that pollution has no boundaries nor frontiers," explains Paolo Bonasoni, researcher affiliated both to Isac-Cnr in Bologna and to EvK2Cnr. "We cannot solve the problem by just paying a fee, and the issue is regardless of longitude, latitude and even altitude.

What happens when serious pollution occurs in urban as well as rural areas at a low altitude is that, as soon as certain conditions are met (warming of the slopes of a mountain, resulting in mountain or valley breeze), valleys turn into canals conveying pollution - which of course is not originally produced at high altitudes - to mountain peaks, glaciers and other natural habitats which are normally pristine and unblemished."

The first step in order to reverse this trend or at least try to limit the

damage is becoming aware of the current situation: in other words, we have to monitor the atmosphere in different places of the planet, first of all in mountainous regions, as mountains represent privileged points of observation to conduct this kind of studies. This was the premise of the Share project, a network of weather stations collecting data which are fundamental both to understand climate change and to provide national institutions with information which is essential for them to take concrete measures.

Measuring climate in remote areas: from the mountain to the sea

A remote climate station gets to Lecco for the High Summit



Pakistan Climate Observatory I-Amica

How do you measure climate in high altitude remote areas? Generally by collecting data in fixed observatories and research stations located at high altitude. Examples of these stations are the Nepal Climate Observatory at the Pyramid located on the Himalaya, the Mauna Loa one in Hawaii or the Jungfraujoch on the Swiss Alps. When such investigation activities are impossible or too complex to be carried out, or it is necessary to get information from sites which are environmentally sensitive, the need arises for sophisticated portable monitoring stations, able to work at an altitude of more than 4,000 m. One of these is the "Remote Climate Station" brought last summer to the Deosai plateau, in Pakistan, for a series of important tests and field measurements. You can take a look at it for yourself and discover how it works at the 2013 High Summit, the international conference on mountains and climate change which will take place in Lecco

from 23rd to 25th October. The RCS system, developed by EvK2Cnr in cooperation with the Italian National Research Council, within the framework of the project I-Amica (High technology infrastructure for integrated climatic-environmental monitoring), sponsored by Miur (the Italian Ministry of Education, Universities and Research), is able to measure the concentration of Short Lived Climate Pollutants, such as black carbon and ozone, as well as to detect the size of the atmospheric particulate matter and to collect weather data. In order to operate, the station requires a limited amount of energy, supplied by two solar panels. A remote connection allows distance interaction between the RCS and technicians, in order to provide real time data. Within the framework of the I-Amica project, besides the implementation of the RCS, the infrastructure of eight monitoring super-sites located in key places of the Mediterranean region is currently being enhanced.

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WATER AND GLACIERS

Less ice and snow

Here is how water cycles will change

by ANTONELLA MANCINI

How does climate change affect the water cycle? To simply associate them with droughts, as is often heard in the news, is rather reductive. Sure enough, when glaciers melt the streams' flow temporarily increases, only to decrease in the long run. "In the last few decades, tangible reductions of the Lombardy rivers – such as Adda, Oglio, Chiese and Northern Italy in general – have been observed in spring and summer, suggesting a reduction in both the area and the duration of the snow cover as well as in the glacial cover surface," explains Daniele Bocchiola, researcher at the Polytechnic University of Milan and EvK2Cnr. In the future, this phenomenon could cause a reduction in water availability in downstream areas, including the Po Valley. "Since temperatures are warmer, at high altitudes the same precipitations result in more rain and less snow. According to our studies, the rivers of Lombardy could be facing significant flow reductions in the next 30–40 years, especially in summer." This would affect agriculture and the water resources management: "In the Alps and the Po Valley, as well as in other areas with a strong nivo-glacial contri-



Karakoram Glaciers

butions such as Himalaya, Karakorum and the Andes, complex water management systems are in place. Faced with the possibility of a decrease in availability, the different downstream users will have to cooperate in order to design and implement appropriate strategies to cope with abrupt changes of the water cycle and extreme events." While there is currently a strong focus on the economic and pro-

ductive scenarios and effects connected with a possible water reduction, research is also looking at the effects that this situation might have on ecosystems. "Changes in the water cycle in mountain ecosystems could also affect the flora and fauna, in particular – but not only – freshwater and riparian species, which would have to adapt to the changes of their own habitat."

The Glacier Inventory

The health of the Earth's "frozen heart" is monitored by the World Glacier Monitoring Service, and data are collected and stored in the World Glacier Inventory. The first inventory in Italy, prepared and published by the Italian Glaciological Committee (Comitato Glaciologico Italiano) together with CNR, dates back to the end of the 1950s, and was subsequently updated in the 1980s. In 2012 the project for a new Italian Glacier Inventory was launched in compliance with the international requirements: this project is set to complete by 2014 and has already published some data: in Lombardy - region with the largest glaciers nationally - the number of glaciers has increased from 167 to 209 due to the numerous fragmentations, though the overall surface has decreased by 23%, going from 115 sq. km in the 1950s to currently 89 sq. km. The inventory was started by the University of Milan with Levisima, in cooperation with EvK2Cnr and the Italian Glaciological Committee. (E.B)



The Karakorum anomaly

Further proof of the significant stability of the Karakorum glaciers in recent decades comes from hydrology: scientific studies suggest that a slight reduction of the strongly cryonival [ice and snow, ed.] downflow from the Indus high basin," explains Renzo Rosso, Professor of Hydrology at the Polytechnic University of Milan. Climatic causes are probably at the heart of the phenomenon, but this anomaly may as well preserve the 18,000 square kilometers of ice cover of this area for a long time. "As part of the joint projects with EvK2Cnr, we are drafting scenarios projections with several climatic models," continues Rosso, "which show how climate change could affect the Karakorum ice around the middle of the century. This development will have significant impact on people, ecosystems and the economy: the melting of such vast glaciers could indeed provide more water for civil uses, although it could also lead to issues concerning hydrological risks."



Face to face with the glaciologist

Interview with Claudio Smiraglia



Claudio Smiraglia, who will Chair the High Summit session focused on the Cryosphere, is amongst the top international experts on glaciers. Professor at the University of Milan and researcher at EvK2Cnr, he is the Head of the Glacier Inventory (Catasto dei Ghiacciai), founded approximately one year ago) as well as being the Italian representative at the International Glaciological Society.

Professor, which will be the hot topics at the conference?

Today the cryosphere can be considered emblematic as the most important symptom of the ongoing climatic changes. First of all, it is necessary to understand the extent of the ice cover beyond the Polar Regions, that is, on mountainous areas. The drafting of the glacier inventories is highly valuable, both nationally and internationally. Thus, there is an ever-increasing need for cross-disciplinary studies (ideological, chemical, technological) in order to face another fundamental to-

pic, which concerns the amount of water present in the cryosphere, both in glaciers and in the permafrost. A third major theme is the ongoing evolution of the cryosphere, which is the subject of very many studies: once the global trend is understood, the priority will then shift into investigating the causes. More specific and technical topics will also be discussed at High Summit, including methods and instruments used in field studies, from satellite imagery to ice coring.

What is the main focus of the most recent studies?

The causes of the reduction in the cryosphere represent one of the topics under the microscope. Today the focus is on the pollutants that are deposited onto the glaciers and which stimulate the melting, such as industrially-produced particulates or, in countries like Nepal, the heavy use of firewood. Moreover,

glaciers are being covered in debris due to an increase in rock falls from mountain walls. The freeze-thaw cycles are indeed increasing and the freezing level is moving towards higher altitudes. The transition to debris-covered glaciers is an increasing phenomenon worldwide.

What could be done to save the cryosphere?

Science should mainly promote a preventive approach. On the short term, it is paramount that all the authorities involved with mountains or the cryosphere actively work towards raising awareness around what is going on.

There are also occasions whereby the scientific intervention specifically addresses the reduction of glacial melt, such as in the case of the Presena glacier, although these are targeted interventions in summer ski resorts and are not applicable on a global scale.

The effective intervention, for example to reduce atmospheric emissions, is however of political nature, therefore extremely complex and has to be dealt with appropriately. On the whole, it is a matter of changing the approach towards mountains and learning how to better manage our relationship with nature and the environment. (V.U)

Glaciers have to become the symbol of a change in understanding our relationship with nature

WATER AND GLACIERS

Melting of the ice and permafrost

Is a warmer planet an unstable one too?

by VALENTINA D'ANGELLA



Pakistan, Gore

Ice, in all of its forms, is amongst the first elements to be affected by the global warming due to climate change. For the past 150 years we have been witnessing a rise in temperature which is causing a severe reduction of the Earth's cryosphere (glaciers, permafrost and snow levels). As an example, since 1850 the ice cover in the Alps alone has reduced by almost half of its surface. The ice and snow thickness, melting every summer at a rate of up to 5-6 meters, is no longer replenished by the winter snowfall. In other words, the cycle of accumulation and ablation is brought out of balance. This issue does not involve mountains alone, with the loss of one of their symbolic features. Glaciers mainly represent hydrological and energetic resources: in the Valtellina, a heavy reduction in ice cover could affect the supply to cities such as Milan. In other regions, such as Asia or the Andes, glaciers are feeding into rivers and provide essential water resources for the subsistence of several peoples. Additionally, mountains become more dangerous. Rocks are held together by interstitial ice and the permanently frozen soil known as permafrost. The rise in temperatures, together with the melting of the ice, weakens the rocky soils causing landslides and subsidences. The snow cover becomes less

stable with the occurrence of avalanches and serac collapses. The scientific community, unlike the press, does not spread unnecessary alarms, although it does acknowledge the situation and the need for proper management through mitigatory as well as preventive measures. In order to do so, it is fundamental to understand the underpinning causes. Some claims attribute it to natural cycles: in Earth's 4.5 billion year history the climate has been ever-changing.

Long cold periods have alternated with others even warmer than today. Humans have had an impact as well: it is demonstrated that the renowned "greenhouse effect" is directly related to anthropogenic pollution and emissions. Recent studies have shown how the ice melting is closely correlated to climate and temperature, but also how anthropogenic pollution, due to depositions on the ice surface, might be critical in favoring and increasing the melting rates.

The cryosphere constitutes 15% of the Earth's land surface (at peak during March and April)

15%

Permafrost covers 20% of land surface, occurring in mountain and Polar Regions

20%

Ice and snow make up for 80% of all the Earth's freshwater

80%

In the last 100 years 5-10% of the ice cover has been lost

5%
10%

In the last 40 years the snow cover has decreased by over 5% in the Northern hemisphere

5%

(Source: Unep, 2007)

Permafrost causes landslides and greenhouse effect?



Forni Glacier, Italian Alps

Permafrost is the permanently frozen layer of the ground that formed during the last ice age, up until 10,000 years ago; even though the Alpine permafrost is so much thinner than the 1.5 km depth of the Siberian one, it is nonetheless present above 2,600 m a.s.l. Soil stability, landslides, water reserves and high altitude vegetation are all connected to the permafrost, whose decline, ascertained by scientific studies and correlated to climate changes, directly affects communities, mountaineers and mountain enthusiasts at large. "Up until 7-8 years ago, permafrost had been studied almost exclusively in the polar regions", says Mauro Guglielmin, Professor at the University of Insubria, researcher for EvK2Cnr and one of the most prominent European experts on permafrost. The

interest increased when it was discovered that permafrost has a large impact on the greenhouse effect: particularly in the Arctic regions, it stores large amounts of frozen organic matter which, once thawed, releases carbon dioxide and methane. Landslides have triggered the alarm in the mountain regions: permafrost deterioration can cause large and deep detachments. The Val Pola landslide in 1987, where bulks of frozen soil were found in the debris, was the first to draw the experts' attention. "Cryoclastism" - meltwater from the permafrost seeps through the rock cracks during the summer season, and then expands when it freezes again in the winter time. Over time, this phenomenon helps the cracks to enlarge, hence compromising the stability of rock walls and mountaineering routes. (E.B)

The world's deepest drilling is Italian

It reaches 235 m of depth and is located at 3,285 m a.s.l. on the Stelvio Pass. Performed in 2010 as part of the SHARE Stelvio project, in cooperation with EvK2Cnr and Fondazione Lombardia per l'Ambiente, the world's deepest permafrost drilling broke new grounds for permafrost research. The shaft, located nearby the Rifugio Guasti monitoring station, is equipped with 15 thermometers at different depths: since the start of the measurements researchers have found a steady thinning of the permafrost layer.

First permafrost study in the Karakoram

In June 2012 the first scientific field expedition was carried out in order to study the permafrost in Karakorum, where studies on this subject are almost non-existent. The estimates of the permafrost cover on these mountains is however surprising: according to the climatic and satellite multi-spectral data, it seems that the permafrost extent might be twice as large as the glacial cover. Researchers have tried to test these data by installing two monitoring stations on Deosai and Baltoro. The expedition was sponsored by the EvK2Cnr Committee within the larger climatic and environmental monitoring program SHARE (Stations at High Altitude for Research on Environment) and was carried out under the scientific supervision of Mauro Guglielmin.

Landslides and ice melting

The Matterhorn, often closed to mountaineers due to the danger of rock falls, is perhaps the most symbolic example of permafrost related instability of the ground which, on the Gran Becca, is monitored mainly by researchers of the Zurich University. On the blacklist is also the legendary north face of the Eiger, which exposes climbers to constant threats of rock falls and land slips. The permafrost alarm on the Eiger was raised by the Swiss WWF in July 2006. The cryoclastism is probably the cause of the August 2003 landslide on the Grande Uja di Ciardoney in the Gran Paradiso National Park, as well as other slides in the Rifugio Vittorio Emanuele area. The collapse of the Cima Una in Val Fiscalina in the Dolomites is another well-known example: there, on the 12th October 2007, 60,000 tons of rock came loose. In general, the whole Dolomites region was affected: le Cinque Torri (2004), Sass Ciampac (2005), Punta delle Dodici (2006), and Pale di S.Martino in 2011, when the Sass Maor collapsed.

Escape forward and northwards

Ecosystems change along with the climate

by VERONICA ULIVIERI

While global warming speeds up the melting of glaciers, the mountain flora and fauna also have to adapt to living in a warmer climate. "In the Northern Hemisphere it has been observed that the rise in temperature tends to shift the range of several animal and plant species further north. What it means is that in mountain regions this shift is towards high altitudes" explains Antonello Provenzale, researcher at Isac-Cnr in Turin and at the EvK2Cnr Committee, who will preside over the session on ecosystems at the High Summit 2013 scientific conference. A phenomenon that "could not be a problem per se, but if we consider animals and plants that have already adapted to live at high altitudes, that is where the issues are: they cannot go any higher and therefore they are threatened to become extinct." Several studies on the biodiversity of the Alps have shown that the most endangered species are indeed endemic ones, meaning those typical of a specific area or ecosystem, such as the rock ptarmigan in the Alps, or species that do not move much because of their adaptation to a particular environment, for example some types of insects. Climate change not only affects distribution areas, but it also has an impact in the phenology of ecosystems, i.e. the seasonal biological cycle: "In the last 30 years or so, snow in the mountains has tended to melt sooner in spring than it did

in the past. This alpine grasses can earlier, but not all species can hasten bits in order to catch these changes." This in what scientists call smatch, "for example on the flowering of grasses and the activipollinator insects. If do not change together, then this could be a problem."

Mountainous areas are amongst the most vulnerable ones in terms of climatic changes and biodiversity, even though, as Provenzale warns, "we have to make a distinction between biodiversity meaning the mere number of occurring species and the quality of the ecosystems. The arrival of lowland plants and animals to higher altitudes could actually increase biodiversity, though in the long run endemic species could become extinct. For example, the spreading of the European hare in the mountains could cause the extinction of the mountain hare. Another example is the leopard, which is moving towards higher altitudes to follow the forest it has adapted to, and by doing so it crosses paths with the snow leopard. "It is hard to make projections into the future", says Sandro Lovari from the University of Siena who, together with EvK2Cnr, launched a research project on the snow leopard.



Genziana (Photo: Sergio Nesi)

"All the species we have today are adaptable ones, so I would not consider it a matter of immediate extinction. Nonetheless, a numeric reduction in the snow leopard population is possible, given the fact that its range is shrinking and that it possesses neither the camouflage coat nor the hunting skills required to survive in the forest." "In this sense climate change could lead to less diverse ecosystems," continues Provenzale, "with effects on humans too. Biodiversity provides valuable services to people. Without it we wouldn't have water to drink, food to eat or the materials we need. Fossil fuels themselves were once alive, they too come from biodiversity," summarizes Sergio Savoia, director of the WWF European Alpine Program, who will be one of the outstanding guests at the High Summit round table on biodiversity, scheduled for the 23rd October in the afternoon.

High Summit takes stock

Mountain parks



Central Karakorum National Park

The 2013 High Summit in Lecco will feature a session devoted to mountain Parks, in support of the importance of safeguarding high altitude ecosystems and biodiversity.

Parks representatives from all over the world will contribute, including Teodoro Adrisano (Majella National Park), Wolfgang Platter (Stelvio National Park), Ashiq Ahmad Khan (Central Karakorum National Park) and Andrew G. Seguya (Uganda Wildlife Authority). Mitigating actions necessary to manage climate change in the mountain environment will be amongst the topics to be

discussed. "Protected mountain environments are extremely fragile, despite the lack of direct contact with human activities," explains Franco Mari, biologist, researcher for the EvK2Cnr Committee and Chair of the session. "They are very much affected by global warming since the species populating them have adapted to live at low temperatures. High Summit will be an important occasion to reflect upon this subject as well. One approach could certainly be the creation of a network bringing together the researchers and those who manage the parks." (S.5)

An Italian park in the heart of Karakorum

Ten thousand square kilometers, counting some of the tallest mountains on Earth including K2, Gasherbrum and Broad Peak. The Central Karakorum National Park, already dreamt about by Ardito Desio when he led the expedition for the first ascent of Mount K2 in 1954, was established in 1993 by the Pakistani government, but only today it is truly becoming a protected area thanks to the management plan drafted by EvK2Cnr together with the Karakorum International University and other local institutions. "We have decided to integrate the classic, purely conservative approach with a more proactive one, based on sharing and on a constant updating of the regulations, which will allow to safeguard the territory as well as promoting the activities of the locals in order to work towards a balanced use of resources," explains Maurizio Gallo, project manager. CKNP is not only the "highest park on the planet", it also includes the largest glacial system outside the arctic regions and is the source of the majority of the country's freshwater. It is an immense area, and yet at the same time a very fragile one that needs to be carefully managed.

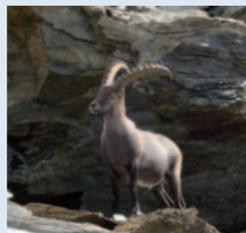


Frozen in time: seedbanks against extinction

Seedbanks – also known as germplasm banks – store seeds from various plant species with the purpose of extending their lifespan beyond their normal viability to up to hundreds or thousands of years, and allowing for reintroduction in different areas. This is one of the methods developed to save alpine plants from extinction. It seems that there are currently around 1,400 seedbanks all over the world. In Italy, the Lombardy Seed Bank was established in 2005, located within the Botanic Garden at the University of Pavia and managed by Graziano Rossi, also a researcher for EvK2Cnr. After the initial collection and cleaning, the seeds are brought into a drying room where they reach around 3-7% of water content, low enough to allow for freezing without the risk of ice crystals forming. At this stage the seeds are stored in large freezers that keep them at -18°C. Based on this model, in 2010, the EvK2Cnr Committee started working on a seedbank of Himalayan seeds. This was the birth of the Himalayan seedbank based in Kathmandu.

Gran Paradiso: are ibexes in danger?

During the period 1985-1995 the number of ibexes specimen in the Gran Paradiso National Park had increased significantly: warmer winters with reduced snow cover increased food availability and hence the capacity to make it through the winter months. However, since 1997 things have changed: despite winters still had little snowfalls, censuses show that the ibex population dropped to slightly less than 3,000 specimens in the whole protected area, and the offspring survival rate was halved. According to several recent studies – including one by Antonello Provenzale et. al. – the causes of this phenomenon could be linked to climate change. A scientific hypothesis attributes this to the early flowering and modification of the mountain flora caused by higher temperatures and the early melting of snow. When the females give birth to the offspring in June and July, they may face a shortage of the plants they require to produce highly nutritional milk. Consequently the offspring could grow weaker and badly prepared to endure the upcoming winter. Another possible cause is connected to the winter survival of parasites and their larvae due to milder temperatures, which would expose the ibex offspring to a higher parasite load. (V.U)



News from the world - Climate, science and mountain

LOBUCHE, Nepal

The Everest Pyramid gets a new look, or rather it gets rid of the old solar panels that will be replaced with next-generation ones, which are more efficient and productive. The new mission took place in the fall 2013, and was born from the 20+ year long cooperation between the EvK2Cnr Committee – who manages the Pyramid Observatory-Laboratory – and Cobat.

NEW YORK, United States

The little snow leopard born at the end of August in the Bronx zoo is in good health, growing steadily and, despite being completely unaware of its own status, has become a symbol of the international cooperation for the conservation of mountain biodiversity. He is the son of Leo, the snow leopard rescued in 2005 in the Nalter Valley, in Northern Pakistan, after his mother and brothers had been killed. Unable to survive in the wild, he was relocated to the USA zoo thanks to a plan by the lucn and the Pakistani government.

CORTINA D'AMPEZZO, Italy

Landslip at 3,000 m a.s.l in the Soprapiss Group, in the Dolomites. The collapse came from the Ciadin del Laudo wall on the 30th September, with a head scarp of 150 m and totaling 1,000 cubic meters of debris. Geologists hypothesize that this was connected to the freeze-thaw cycle, as at this time of the year temperatures get close to 0°C at night while they increase during the daytime.

SKARDU, Pakistan

A large Unesco reserve around K2, in Northern Pakistan, extending to the border with China and merging Central Karakorum National Park with Khunjerab National Park. This proposal was drafted by the EvK2Cnr Committee in cooperation with the central and regional authorities in Pakistan, and was submitted to Unesco on the 30th September.

BORMIO, Italy

The maximum thickness of the Forni Glacier in Valtellina, the largest valley glacier in the Italian Alps, is about 120 m. This unprecedented measurement is part of the EvK2Cnr Share-Stelvio and Paprika projects and was performed with new radar equipment manufactured by the Ingv laboratories in Rome. As part of these projects, the glaciological unit coordinated by Prof. Claudio Smiraglia from the University of Milan is also measuring the depth of other Italian glaciers, such as the Careser in Trentino and the Miage on Mount Blanc.

OSLO, Norway

The retreating of the Lendbreen glacier in Norway has uncovered a whole and well-preserved tunic made from sheep wool. The discovery took place two years ago at around 2,000 m a.s.l. Carbon dating results have now been published on the magazine Antiquity and, standing at 1,700 years old, the tunic dates back to the Iron Age.

SONDRIO, Italy

Global warming forces the flora and fauna to pack up and relocate to higher altitudes. Researchers have quantified the "migration" of plants and animals that shifted towards higher altitudes, following favorable conditions, by comparing data collected in the Bernina in the 1950s with those of the early 2000s. The fastest ones move at an average rate of 35 meters every three years.

RWENZORI, Uganda

In spring 2013 an EvK2Cnr expedition installed a new weather station at 4,700 m a.s.l. on the Rwenzori in Uganda, the third tallest mountain in Africa, mountain also known as Mountains of the Moon and it was a success. It was all part of the Nextdata and SHARE projects, in cooperation with the University of Nairobi and the Uganda Meteorological Department. (photo below)



ISLAMABAD, Pakistan

Snow, ice and debris from glacier tops: samplings will allow scientists to collect invaluable information, in some cases very recent data, on high altitude bacteria. This is part of the project that researchers of the EvK2Cnr carried out last summer on the Gasherbrum I, an eight-thousander in the Karakorum range.

Watch Alfred's misadventures in video www.highsummit.org

Find out what you don't know about climate and mountain with Mario Tozzi and the interviews with the EvK2Cnr researchers

If climate changes, Yeti is in trouble!

by VALENTINA D'ANGELLA

Alfred is a Yeti in trouble. He used to live on the mountains, on the high altitudes of perpetual snow and glaciers. One day, though, he found himself without a home: global warming and climate change melted it completely and so Alfred had to migrate and look for another lair.

And his problems are not over yet: he cannot take a bath, because the streams are all dried-up; he wishes to go skiing, but instead of snow he only finds green slopes with peddlers selling coconuts, just as it happens on a beach. He is looking for peacefulness, but he is annoyed by his new neighbors: animals unexpectedly arrived to the "high altitude districts" looking for the food they no longer find downstre- am. As far as humans are concerned, it is certainly not that better: no one is left to scare in the villages, and if he manages to meet someone, the mountain is very likely

to slide on his head.

These are the mishaps of "Alfred K. Everest", struggling with a world thrown into confusion by climate change. The Yeti, chosen as the High Summit 2013 testimonial, is the protagonist of a series of video clips posted on www.highsummit.org, aimed at intriguing and entertaining viewers. At the end of each episode, the presenter, Mario Tozzi (a researcher affiliated with Cnr, the Italian National Research Council) tries to explain, using a virtual board, the causes of the problem afflicting Alfred, while the researchers of the EvK2Cnr Committee go into the details of the matter in a series of video interviews.

The videos are also broadcast on the screens placed on the walls of the EvK2Cnr-Cobat Multimedia Pyramid located in Piazza Cermenati in Lecco from 3rd to 25th October.



SOCIO-ECONOMIC IMPACTS

Global warming and high altitude

An economic matter. Here is the reason why

by VALENTINA D'ANGELLA



Alps, Laghi Gemelli Dam (Photo: V.D.A)

Those who think climate change is an issue which has nothing to do with their pockets are deluding themselves to say the least. There is indeed a very close correlation between climate and economy, at a global level. The famous economist Nicolas Sterne was among the first to support this correlation in 2006. Appointed by the British Government, he published an astonishing report. Sterne asserted that contending with climate change today would imply an investment accounting for 1% of GDP, at global level, whereas a policy of "just sit and watch" would mean spending from 5 to 20% of global GDP in the future. At the time of publication, the figures seemed to be an exaggeration, though at present they could be considered as an optimistic estimate.

The connection, if you think about it, is clear. On the one hand, climate change triggers environmental disasters that we have to face, as they are directly linked to our very survival; on the other hand, climate change jeopardizes the natural resources which sustain our world. If floods, famines and hydro-geological disasters can sweep away entire villages and threaten thousands of

people with starvation, we should not forget that natural resources represent our food and the materials we need for all our activities. Many of these resources can be naturally found in the mountains, but they can be exploited even in very distant areas, if for no other reason than the fact that high altitude regions are much less populated and industrialized when compared to urban areas. Let's consider, for example, water resources: hydroelectric power plants depend directly on the melting of snow and glaciers. The reduction in surface water flows and the decrease in precipitations have consequences on the filling of dams, with repercussions on energy production. But there is more to it. Drought and temperature increase constitute the most serious threats to agricultural crops. "With the increase in temperatures," says Martin Beniston, the Swiss climatologist who has focused on this topic with the European project ACQWA, "the water consumption due to evapotranspiration increases, with a potential demand for further irrigation aimed at getting optimal output (+10% in July on the Swiss Alps from now to 2049)." Atmospheric pollution

has serious implications for human health and, in turn, for economies. According to data produced by the Project Surya, air pollution, especially indoor, considerably reduces attendance and productivity in schools and workplaces. In India approximately 1.2-1.6 trillion working days are estimated to be lost due to the respiratory diseases caused by indoor air pollution. From the individual point of view, this corresponds to a considerable salary reduction which weighs heavily upon household budgets, quality of life and even schooling. These are but a few examples of how global warming influences people's spending habits, but they are enough to explain how, at a certain point, climate change entered abruptly on the global economic agenda, with particular reference to the carbon emission market. This is one of the flexible strategies devised by the Kyoto Protocol to mitigate climate change, a mechanism determining a limit for carbon emissions and the principle according to which those who are virtuous and produce less emissions deserve an incentive, whereas those who pollute more will have to pay accordingly.

Emission market and carbon credits

The emission market is a mechanism creating a specific limit to carbon emissions, whereby those who are more virtuous and pollute less deserve an incentive, measured in credits. Those who pollute more, have to pay more accordingly. Credits have an economic value and there is even a stock exchange of carbon credits, with operators carrying out financial transactions through the exchange of credits (each of them representing a ton

of CO₂). The European Emissions Trading System (EU ETS) is currently the greatest global market for carbon credits: in 2011 it reached 8.33 trillion tons of CO₂, corresponding to 76 trillion Euros. Besides the national and international markets which are regulated by specific institutions, there are "voluntary" markets, allowing subjects to voluntarily compensate their emissions, by means of a mechanism known as "carbon

offset". In Italy, according to the data of the Ministry of Environment, the voluntary carbon credit market has reached an amount of 244,000 tons of CO₂, compared to 34,600 tons in 2009. Currently there is no real carbon credit market which is specific to mountain areas. Such a theme could be developed in the future and be closely linked to activities such as reforestation and sustainable agriculture.

Climate, mountain and carbon credit

An expert explains



Stefania Proietti, who will chair the High Summit session devoted to the emission market, teaches at the University of Perugia, Department of Industrial Engineering, and works as a researcher in association with EvK2Cnr, specializing in carbon trading.

How does climate change affect economy?

First of all, by acting on resources. Once our resources are depleted, it will be necessary to find some more elsewhere. On the other hand, climate change determines the exacerbation of certain phenomena, which we will eventually have to face. According to the data of the Ipcc fourth report (now outdated), in 100 years, because of climate change, there will be 250 million environmental refugees, who will be moving in huge numbers, pushed by the sea level rise, temperature increase,

famines and droughts. Economy will undoubtedly be affected by all this.

Something we can already see is the increase in the frequency of catastrophic events in densely populated areas. Hurricanes, for example, are getting increasingly common and the damage they cause inevitably weighs upon GDP. If you consider that, presently, more than 70% of the world population resides in metropolitan areas, the risk is even greater.

What do mountains have to do with all this?

Mountains are the bellwether of climate change. Once occurred in urban areas, climate change has repercussions on the whole world. Mountains are significantly affected by these repercussions: suffice it to say that the retreat of glaciers deeply affects faraway places, as it is shown by undisputable scientific data. Just a few days ago Ipcc produced the Working 1 papers, a first step towards the publication of the next framework report, which will contain much more alarming data than those contained in the 2006 document. The current report says 95% of climate change is due to anthropogenic causes, while the previous one indicated

a lower percentage. Mountain areas per se do not influence climate change, because they are inhabited by few people, who tend to preserve the environment where they live. Mountain areas, however, have water resources which are essential both in terms of energy and supplies of drinking water: the Himalayan region alone provides approximately 2 billion people with water. Though connected to lower incomes, mountain economy and climate change are extremely important. The carbon credits established by the Kyoto Protocol can have a significant impact here, as they can economically reward those who pollute less.

How can the emission market be relevant to mountain areas?

Projects involving a better use of water resources for the Himalayan region or reforestation in a deforested area in Africa reduce CO₂ emissions, therefore they can be rewarded with carbon credits, which correspond to the amount of tons of emissions that were not created thanks to these initiatives. How can they be related to the mountain? By devising a mechanism whereby the popu-

lations living in the mountains and preserving the local habitat with the adoption of sustainable agriculture practices, traditional farming techniques and the reforestation of specific areas can actually earn credits. Such credits can be sold to less virtuous subject, thus becoming an important resource for the poorest areas of the world. (V.D.A)

The case study

Olive groves in the Italian region of Umbria are like carbon stocks. Though this plant involves CO₂ emissions while being cultivated, during its growth it absorbs more carbon than what is produced during the industrial production cycle. This can generate credits, which can be quantified and sold, creating an income, to the benefit of those who protect their ecosystem and their territory.

ENVIRONMENT AND FUTURE

High Summit towards COP19

The mountain on the Warsaw agenda

by BEATRICE CASINI



Nuptse and Everest (Photo: EvK2Cnr archive)

A call to the World's powers by the international scientific community to support a greater focus towards mountains and their ecosystems. This is the target set by High Summit 2013 to be presented at the next United Nations conference on climate change, through the submission of a document undersigned by all the Lecco conference attendees, and to be presented at the side event "Cryosphere, climatic changes and development: risks and solutions", organized by ICCI (International Cryosphere Climate Initiative) in cooperation with the EvK2Cnr committee and the Clean Air Task Force on 16th November.

Warsaw will be a key date for our planet's climate. On 11th November, the annual Conference of parties (COP19) of the signatory Countries to the Convention framework of the United Nations on climate change will kick off. As in other meetings, the policies of greenhouse gas reduction will be at the core of this nineteenth edition of the summit. Meanwhile, the meeting of the Kyoto Protocol signatory countries will also take place, having been extended to 2020 at last year's COP18 in Doha, Qatar.



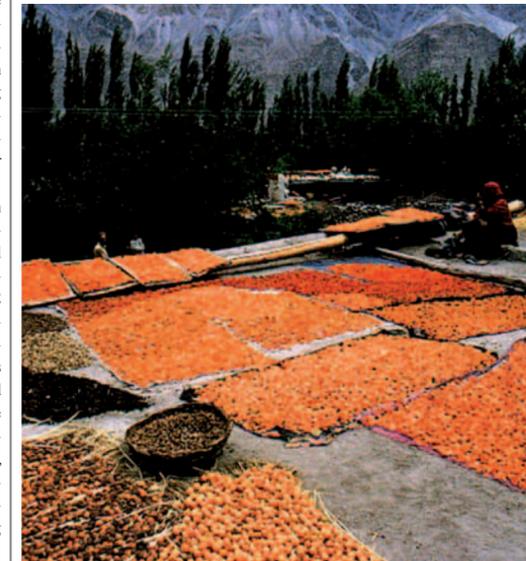
At the side event, EvK2Cnr will present and distribute the document that will be approved on the 25th October at the end of High Summit 2013. "We are gathering recommendations from the various Chairs of the High Summit sessions, and we will ask the attending scientists to sign it in order to bring the focus of the international community onto the safeguard of the planet and particularly of the mountains, which are sources of life, water and biodiversity", says Paolo Bonasoni (researcher at the Isac-Cnr) who is drafting the manuscript together with Elisa Vuillermoz (coordinator of the research projects of EvK2Cnr, who organized the Lecco summit) and the members of the conference scientific committee. "The IPCC puts focus on mountains and their glaciers, as highlighted in the Technical Summary WGI Fifth Assessment Report (TS.2.5.4)", continues Bonasoni, "and it also states how glaciers in

Asian mountains, including Himalaya, of the southern Andes, Alaska, Canadian Arctic and part of Greenland are listed amongst those which have lost most of the ice cover in the last decade: these areas make up for more than 80% of the lost glacial mass. The document we are about to prepare therefore aims at increasing the attention on mountains worldwide, first and foremost by addressing development and integration of scientific research, considering that these regions represent an invaluable resource which is too often threatened by humans and their activities", concludes Bonasoni. The side event will examine in depth the required mitigation strategies in order to slow down global warming in mountainous areas: integrated measure concerning CO₂ emissions and atmospheric pollution based on new models supported by the World Bank. Ministers of Countries negatively affected by climatic changes will attend the event, together with representatives of UNEP and the World Bank, researchers from the Joint Research Centre, NASA, Hadley Centre for climate change, Reading University.

A coalition to mitigate the effect of pollutants

The "Climate and Clean Air Coalition" (CCAC) was established within the framework of the United Nations Environment Program (Unep) in February 2012 and today, with more than 50 partners including governments and NGOs, it is the greatest organization in the world to promote and coordinate the actions plans aimed at mitigating the effects of short lived pollutants. The latter include black carbon (the heavy layer of particulate matter made of carbon and soot suffocating many areas of the planet, especially in Asia), methane and some fluorinated gases (Hfc). Although they remain in the atmosphere for a limited amount of time (ranging from a few days to some years), not only do these pollutants worsen climate change (they increase global warming, influence atmospheric circulation and the melting of snow and glaciers), they are also responsible for the loss of tons of agricultural crops and for the incidence of cardiorespiratory pathologies causing more than 2.5 million deaths every year.

Their reduction, through the shared adoption of specific policies, would result in significant progress in contrasting global warming and improving air quality in a relatively short time. The main objective of the Ccac is exactly to raise awareness of the environmental and economic damage caused by this type of pollutants, as well as to promote cooperation, scientific research and new mitigation strategies. In March 2013, the EvK2Cnr Committee was officially accredited as a coalition partner for the high level of its research activities concerning black carbon and other short lived pollutants in mountain regions: the data provided by EvK2Cnr, first of all in connection to the Share project, contribute to the understanding of their impact and their transport, especially in mountain areas. Their continuous monitoring makes it possible to elaborate scientifically accurate strategies to mitigate their effects, in line with the programmatic goals of Ccac. (E.B)



LECCO EVENTS

Mountain voices

Climbers and scientists make a splash at the theater on 24th October

Mauro Corona together with Mondinelli, Bernasconi, Panzeri and Da Polenza are on stage together with the High Summit luminaries. Presented by Omar Fantini by EMANUELE BRIGNOLI

Mauro Corona on one side. The glaciologist Claudio Smiraglia, the medical doctor Annalisa Cogo and the climatologist Antonello Provenzale on the other.

international renown, such as Antonello Provenzale, Claudio Smiraglia and Annalisa Cogo, lead speakers at the "High Summit" International Conference (23rd to

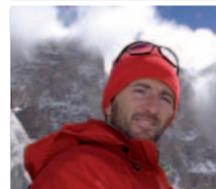
25th October). The experience of Agostino Da Polenza (climber and President of the EvK2Cnr organization) will be the "bridge" between the two worlds.



Mauro Corona
Climber, writer and sculptor



Agostino Da Polenza
EvK2Cnr President



Daniele Bernasconi
Climber and alpine guide, Ragni di Lecco



Silvio Mondinelli
Climber and alpine guide



Mario Panzeri
Climber and alpine guide

Agostino Da Polenza acting as a mediator, and Silvio Mondinelli, Daniele Bernasconi, Mario Panzeri contributing with their testimonies. Mountaineering and science meet in Lecco on Thursday 24th October. Sweat and knowledge get together for this not-to-be-missed show, which will be presented by Zelig comedian Omar Fantini, and which is aimed at talking about mountains and discussing their issues, taking advantage of the close link between those who live the experience of the mountain and for those who study it.

Mountain voices will let these seemingly different aspects of the mountain talk together, involving leading personalities from both worlds. Mario Panzeri and Silvio Mondinelli (both of whom have climbed all the 14 eight-thousanders without oxygen) and Daniele Bernasconi (member of the "Ragni di Lecco" mountaineering club and pioneer of many historic ascents including Gasherbrum II's North Face) will be the professional climbers on stage at the Teatro della Società in Lecco. On the mountain they have risked their lives, yet at the same time, almost paradoxically, they have built their future.

Those who study mountains will be represented by researchers of

ders of the cultural and folkloristic heritage of our mountain areas. Proud and stubborn, Corona loves and defends this traditional aspect of the mountain, characterized by the knowledge of generations of old school climbers who sweated and toiled on slopes and rises.

These two worlds, which also differ from the point of view of time, will be facing each other on stage, each one with its values and its limits. Omar Fantini, famous TV comedian and presenter, will be the host and moderator of the event.

Tales and music will meld together, to further liven up the night. Solutumana, a pop-folk band from Lombardy, influenced by folk

music as well as by the songwriting tradition, will also be present. All these different faces and voices have a common denominator: the same passion for mountains and a concern for the changes they are going to face. The Yeti Alfred K. Everest, testimonial and mascot of the High Summit, will also be there to remind us of the current climate changes, an issue which is going to be the leitmotif of the international conference.

24 October from 18 to 21

HAPPY HOUR IN THE TOWN CENTER

Come and taste the flavor of the mountains of the world, while walking between the town center and the Lecco lakeside! On Thursday 24th October, High Summit invites citizens to a very special happy hour completely devoted to mountains. From 6 p.m. to 9 p.m., for the special price of 1 euro, in the cafes and restaurants of the town center you will be able to taste specialties from the Andes, Alps and Himalayas, ranging from pizzoccheri to basmati rice, all of them accompanied by something to drink. You will only have to get a voucher from the High Summit info-point located in piazza XX Settembre and go to one of the places participating in the event. A dj-set will provide the music background. Watch out: 100 lucky ones will enjoy a free tasting by subscribing to the newsletter on the www.montagna.tv webpage!

HIGH SUMMIT

Inauguration night on 22nd October with the films of the "Ragni di Lecco"

The film "Infinite Jest" by the "Ragni di Lecco" mountaineering club will officially lead off the dances of the High Summit, the event devoted to mountains and climate change that will take place in Lecco at the end of October, organized by the EvK2Cnr Committee. The appointment is for Tuesday 22nd October at 9 p.m. at the Chamber of Commerce Auditorium, where three videos produced by the Ragni di Lecco Group will also be projected. The film "Infinite Jest", made in cooperation with Flying Film Production, is based on the climbings of Matteo Della Bordella and Fabio Palma on the natural calcareous set of the Swiss Wenden, where from 2005

to 2011 three extremely difficult new routes were opened. "Wenden is like a temple of beauty and difficulty for climbers," says Fabio Palma, President of the "Ragni di Lecco" mountaineering club. "It demands a lot from the fingertips and the mind of those who are not content just with looking at it." The event will be enlivened by the presence of the pianist Simone Morandotti and the guitarist Mike Guzzo. Vico Valassi, President of the Chamber of Commerce of Lecco, will do the honors together with Agostino Da Polenza, President of EvK2CNR, the organizing committee of the High Summit.

"Breathing Himalaya" on display in Lecco on the occasion of the High Summit



Air, pollution, high altitude and pathologies of the respiratory tract. This is the subject of the Exhibition "Breathing Himalaya: Impariamo a Respirare" (let's learn how to breathe), a journey through pictures and other media, between nature and science, set in Palazzo delle Paure, in Piazza Cermenati, from 3rd to 25th October. An almost unknown aspect of Himalaya, a remote and pristine region according to popular belief, emerges at the end of the journey. Such an idea is, in fact, inaccurate and within the framework of the Share project, the EvK2Cnr Committee is monitoring the environmental situation at the foot of Mount Everest, and unexpectedly detecting significant levels of pollutants. The exhibition casts light upon the medical and environmental research activities currently ongoing in the area, aimed at investigating upon the issue of the indoor pollution produced by the use of biomasses (wood, dung, harvest residues) burnt inside the houses, in open braziers, often in the absence of chimneys, for heating and cooking purposes. This

results in numerous respiratory or cardiovascular pathologies. The project, coordinated by Dr. Annalisa Cogo (Ferrara University), focused specifically on the collection of data related to the impact of pathologies of the respiratory tract, such as Chronic Obstructive Pulmonary Disease (COPD), which increasingly affects our urban environments, being the fifth leading cause of death in the world. The synergy between EvK2Cnr and Interactivecom resulted in this exhibition, an educational initiative aimed at disseminating the invaluable information made available both in the Himalayan region and in Italy, thus favoring the spread of prevention strategies. The exhibition is sponsored by the Province of Milan, Ferrara University, Assintel, Boehringer Ingelheim Italia and Pfizer Italia. Visiting hours at the Palazzo delle Paure are Tuesday to Friday from 3 to 7 p.m. and Saturday and Sunday from 2 to 8 p.m. Admission is free. To learn more: www.breathinghimalaya.org

RESTAURANTS PARTICIPATING IN THE INITIATIVE

Alpino Happy Hour:

Bar Cermenati, Bar Plaza, Frigerio, Ristorante Azzecagarbugli, Bar Manzoni, Il Labirinto, Interval Café

Himalayano Happy Hour:

Caffè Commercio, Sunflowers, Bar Crystal

Andino Happy Hour:

Osteria Ai Granai, Il caffè, Caffè Teatro

LECCO ALPINE TOWN OF THE YEAR

From selective waste collection to walking buses

Vittorio Campione introduces the Alpine Town of Lecco



"Being awarded the title of 'Alpine Town of the Year' 2013 was not just an arrival point for us. It rather encouraged us to keep walking the path of environmental sustainability," explains Vittorio Campione, 45 years old, Deputy Mayor and Councilor for Transport and Environment in Lecco. There are many current projects aimed at making the town "greener", ranging from walking buses to selective waste collection, not to mention bike and car sharing programs. "High Summit," continues Mr. Campione, "the international event focusing on mountains and climate change, taking place in our town at the end of October, is just the highlight of so many initiatives."

Mr. Campione, what are the projects that earned Lecco the 'Alpine Town of the Year' award?

First of all, the walking bus project. When it was launched in Lecco, in 2002, it was amongst the first experiences in Italy, and has today achieved significant results: 700 children, 28 lines, 230 adult leaders, with a considerable reduction of traffic and pollution.

The panel was certainly influenced by our climbing tradition, our love of mountains, and also by our projects aimed at the safeguard of the territory, especially our selective waste collection. Lecco has designated Lecco as "comune riciclone" (recycling municipality) and, two years ago, they even awarded our town with the title of "Best District Town in Lombardy" for selective waste collection. Even Coreve recognized the achievements of our town (which received a prize shared with Prato and Brindisi) for the high quality of its separate collection of glass.

What are the actions that have

already been implemented for environmental sustainability within the framework of the award?

We have created a series of routes to make the most of our water resources, starting from Water Houses, where everybody can get still or sparkling water. Four installations are already in place and they have supplied more than 600 thousand liters in a few months. We are installing two more Water Houses in order to cover the whole territory. The project proved very successful: it is so simple, yet it had such a positive influence on waste production and the pollution caused by traffic. Other

actions are related to mobility and traffic regulations. A bike sharing project was launched one and a half years ago, with five stations where people can get a bike for an annual membership of 20 Euros. We are currently improving it by creating a new station and by introducing electrical bikes that will certainly help overcome the steepest slopes. As for the future, we are soon going to implement a car sharing project.

How is the town getting ready for the High Summit?

The Summit represents the highlight of the 'Alpine Town of the Year' program, since it draws the attention to our town and to issues

concerning mountains and climate change, combining the award we obtained with a more global concern over such issues. We have made our infrastructure available and we have created synergies with local associations and other stakeholders. The program connected to the High Summit is full of initiatives, launched in cooperation with the Municipality, and involving not just experts, but the general public. As provided for by the Alpine Convention, the aim of the program is also to raise people's awareness in connection to the safeguard of the territory and to the environmental best practices. (A.M)



A multimedia Pyramid in Piazza Cermenati

I support High Summit: Luca Argentero, Antonio Rossi, Daniele Bernasconi and other VIPs commit themselves to the mountain cause

What does the Pyramid Laboratory-Observatory of the EvK2Cnr Committee, located at the foot of Mount Everest, look like? From 3rd to 25th October you will be able to see a reproduction of it in Lecco, in Piazza Cermenati. It is the EvK2Cnr-Cobat multimedia pyramid: an aluminum and Plexiglas structure, more than three meters high. The walls will be equipped with interactive screens providing information related to the ongoing events and to the topics which are the focus of the High Summit. The monitors will be broadcasting videos concerning mountains and climate change, as well as the adventures of the Yeti Alfred K. Everest, enrichment video reports by scientists and clips by unexpected testimonials, such as well-known climbers Silvio

Mondinelli and Daniele Bernasconi, actor Luca Argentero, comedian Omar Fantini (who will present the 24th October night event together with Mauro Corona) and other scholars and climbers. Visible from the lakeside and located in one of the town's strategic points, the Pyramid will be officially inaugurated on 3rd October and will help introduce citizens and tourists to issues related to mountains and climate change. The installation of the Pyramid is sponsored by Cobat (Consortium for the recovery of batteries, electrical waste and photovoltaic modules), which only last month carried out a mission in Nepal, in cooperation with EvK2Cnr, aimed at replacing batteries and photovoltaic modules supplying energy to the Everest Laboratory. (V.U)



The Mayor of Lecco Virginio Brivio inaugurates the multimedia Pyramid EvK2Cnr-Cobat

HIGH SUMMIT AND LECCO

Municipality, Chamber of Commerce, Polytechnic

Roped together in Lecco for the mountain

Mountains are an essential part of Lecco's identity: a piece of DNA, a fundamental component of the economic fabric, a portion of the territory to be studied and promoted. EvK2Cnr and its partners in the organization of the High Summit strongly advocate this concept. "We really believe in this event and we want the award we received as Alpine Town of the Year 2013 to hold together these two aspects: experience the mountain and, at the same time, get from it useful teachings for everyday life," explains the Mayor, Virginio Brivio. As far as the new experience of the mountain is concerned, the Municipality is very active and is reconsidering the way mountains can be enjoyed. "The relationship with the mountain," continues Mr. Brivio, "needs to be less greedy, compared to the last few decades. We are recovering tracks and trails together with local associations and we intend to make shelters available not just to experts, but also to families." As for more scholarly activities concerning mountains, researchers and scientists from Milan Polytechnic are working on several projects focused – for example – on the impact of climate change on high altitude water resources as well as its effect on those available downstream. "The areas being currently studied include the Alps, Himalaya and the Andes," says the Pro-Chancellor of the Lecco University Campus, Marco Boccione. "These regions are profoundly affected by climate variables." The current studies have created a starting point for future work aimed at suggesting possible approaches to the management of climate change and its influence on the hydrological cycle, as well as on food and water safety in the most densely populated areas downstream. "The fact that events like the High Summit are organized in Italy is proof enough of the existence of a lively scientific community that has much to say and share," adds Prof. Boccione. "The High Summit will take place in the new campus of Milan Polytechnic in Lecco. Opening the campus to events of such international significance makes it possible for the Polytechnic to act as a catalyst and a disseminator of knowledge, a role the Polytechnic is supposed to have in the areas where its premises are located. In order to create a research center of excellence, which is international and operates to the benefit of the region and local companies, a building hosting Cnr laboratories will be created, where scientific teams affiliated to both institu-



tions will have the opportunity to work." Apart from being a place for research and recreation, Lecco mountains are characterized by a robust economic fabric, made up of a variety of companies manufacturing high quality products that make Lecco famous around the world," says the President of the Chamber of Commerce of Lecco, Mr. Vico Valassi. To promote the environmental resources, the beauty of the landscape, as

well as the potential for research and innovation, the Chamber of Commerce is working together with the Municipality and the Polytechnic to launch the project "Eco-Smart Land", a "local laboratory for the creation of an integrated system aimed at offering eco-tourism and cultural opportunities which are also environmentally friendly," concludes Mr. Valassi, ready to present the project at the High Summit. (V.U)

An App to promote the Lecco mountains

The Lecco mountains go digital: at last it is possible to access information on mountain huts, walking trails as well as sites and sights such as adventure parks, caves and mines in the Lecco Alps directly from your smartphone. On the occasion of High Summit, the City's Chamber of Commerce – in cooperation with Telecom and the local tourist and business companies – has developed an App to promote the excellence of the area, with a section also dedicated to the mountaineering tradition containing information on this sport and the "Ragni" mountaineering club. A preview of the first version of the App – developed as part of the "Eco-Smart Land" project – will be made available to the subscribers of the international conference.

Organizing Committee



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