

# Ny-Ålesund Newsletter

25<sup>th</sup> Edition – January 2010

## Sverdrup Station

At the Sverdrup Station there have been a number of personell changes within the last 6 months. While waiting for the new optical engineer to arrive, Sanja Forstrøm had temporarily filled in June and July 2009. In August then, Vigdis Lonar Barth started her position as the new optical engineer at the Sverdrup station.

In July, two new station managers started their position at the Sverdrup Station. Fiona Danks and Max König will alternate as station managers in two month terms. In those periods where the other is in charge of the station, each will follow their research interests in Tromsø, Fiona Danks in biology and Max König in glaciology and remote sensing. A station manager will be present at the station from March through November, in the more quiet winter month they will administrate the station from their offices in Tromsø. The station will, however, continue to be occupied throughout the year by both engineers and the head of logistics. Between November and February they will in general be available for visitors only during the weekends, in the remainig year as before on all seven days of the week.



*The whole team at the Sverdrup station*

In November, the new homepage of the Sverdrup Station with updated information and a new registration page, was launched and can be found at: <http://sverdrup.npolar.no/>. All scientists and guests visiting the Sverdrup Station and wishing to use its resources are kindly asked to register at this web page. The station managers will then continue the booking process with Kings Bay.

*By Max König, NPI*

## ARCFAC V news

EU-funded projects aiming at better use of the existing research infrastructure in Ny-Ålesund – ARCFAC V has entered its last year of existence. The last project selection meeting took place in Paris, 2-3 December 2009. The last call for proposals brought record high amount of applications (49 eligible proposals). The total number of days of research applicants applied for was over 3100 while ARCFAC had resources to fund only 500 days this year. Therefore the competition was very high and not only scientific value of the project but also other criteria (e.g. its feasibility and capacity of stations in Ny-Ålesund) played

equal roles. The User Selection Panel offered 16 projects free access to the Ny-Ålesund Research Infrastructure in 2010. We expect 32 researchers from 10 countries to conduct their field studies within 6 different scientific disciplines in 2010 in Ny-Ålesund.

We congratulate the leaders of the successful projects and we wish them all a very fruitful season!

List of funded projects, projects summary reports and other information can be found at the ARCFAC website at:

<http://arcfac.npolar.no>

*By Marzena Kaczmarek, ARCFAC*

## The Norwegian Mapping Authority is planning a new fundamental station in Ny-Ålesund

The existing observatory has been operation since 1994, and an upgrade is needed to meet new requirements and achieve higher accuracy. To achieve higher accuracy you need to do more intensive observations in real time in the global infrastructure of VLBI stations.

The increased volume of data in real time requires a fiber optic cable to Ny-Ålesund. This is a prerequisite to start the project and will also have significant positive effects for other scientific activities in Ny-Ålesund.

The Norwegian Mapping Authority (NMA) is currently applying for project funding of €20-25 Million and applying for the necessary licensing and permits to start the project. If the necessary funding is granted, the new station can be in full operation by 2015.

For more information – contact NMAs representatives in Ny-Ålesund or contact the project manager Line Langkaas ([line.langkaas@statkart.no](mailto:line.langkaas@statkart.no))

New staff at Ny-Ålesund Geodetic Observatory:

- Carl Petter Nielsen, Station Manager
- Lars Karvonen, Operator, from 1th of February

*By Line Langkaas, NMA*

## The Amundsen-Nobile Climate Change Tower: A platform to investigate processes at the surface and in the low troposphere

*V. Vitale, A. Viola and C. Lanconelli: Institute of Science of the Atmosphere and Climate, Italian National Council of Research*

The Arctic ABL poses a challenge for all models due to its persistent stable stratification and the important role of ice phase microphysical processes in the formation of boundary layer clouds. Moreover, forcing factors as radiation, conduction, turbulence, subsidence and advection processes increase the complexity of the system. Boundary Layer mixing processes are very important to determine aerosols characteristics and depositional processes of Short living pollutants (SLPs). The possibility offered by Ny-Alesund to have continuous measurements within and above the ABL can be very important to assess the importance of surface processes with respect to vertical-

exchange phenomena and advective processes, along the whole year.

As key element of a multidisciplinary project to study chemico-physical processes at the surface and in the low-troposphere, CNR funded the installation of a 33 m height platform, to provide a structure capable to host large set of instruments operational in the same location all year long, with advantages of a easy maintenance and control. This structure will be also contribute to develop or/and increase cooperation activities. The Amundsen-Nobile Climate Change Tower (CCT), constituted by 17 modules of 1.8 x 1.4 x 1.8 h, (photo 1), were put on place by Kings Bay during spring/summer 2009 South West the village at a distance of about 1200 m and oriented along the prevailing wind direction. A hut, about 30 m North from the tower, hosts computers and communication systems. Connection with Dirigibile Italia and any internet access point is assured through a fiber optical cable. Cabinets cabled about each 6 m on the tower, assure power supply and data connection with the hut. Each cabinet hosts 2 power circuits (220 V, 2300 W 10A) each with 3 outlets, and for data communications 6 RJ45 1000/100/10 Mbyte/s connectors.



**Photo 1:** The Amundsen-Nobile Tower and the hut hosting computers and communication system.

In September 2009, the tower has been equipped with a first set of instruments to measure all components of the radiation balance and surface albedo, the vertical profiles of meteorological parameters, the temperature profile and heat flux into the snow, the snow height and snow skin temperature. Angelo Viola and Christina Lanconelli (photo 2) of ISAC-CNR Institute spent three weeks in Ny Alesund to provide the complete installation and the activation of the real time link with Italy including the daily data transfer. They had to overcome several technical and logistic difficulties to succeed in their mission, also because bad weather conditions did not help the planned time schedule. So they had to work hardly to make maximum use of available time.

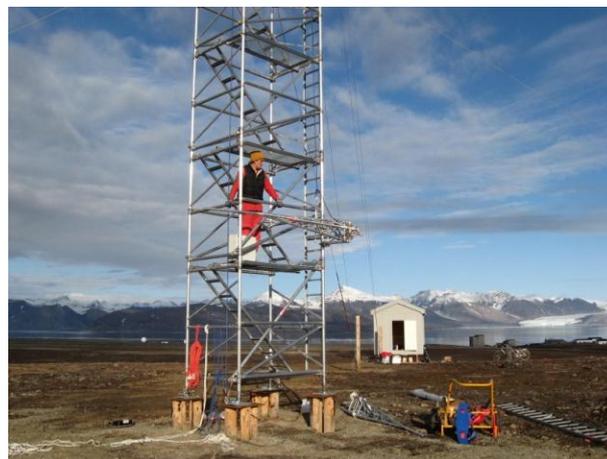


Angelo Viola

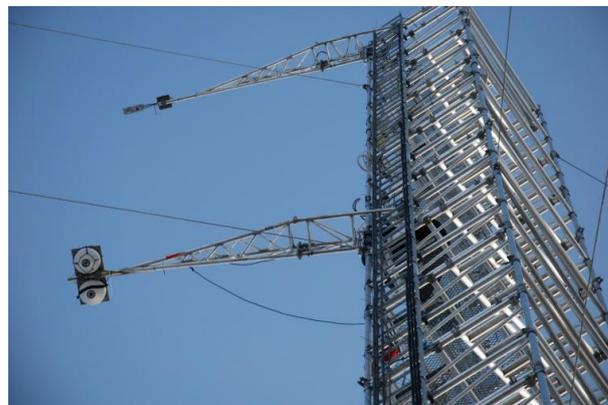


Christian Lanconelli

Photos 3-5 show the different phases of the work performed. Photo 3 shows a mounting test of the boom before the final installation of the radiometers that is shown in Photo 4. Photo 5 shows the lowest two level of the meteo sensor that complete the set of instruments installed to monitor atmospheric surface layer. Finally after the setting of the acquisition system in the hut and configuring the connection with sensors on the tower, it was possible to provide the communication link with the data server in Italy to allow the real time checking and downloading of the data.



**Photo 3:** Beginning of installation – tests of rotating booms for radiometers

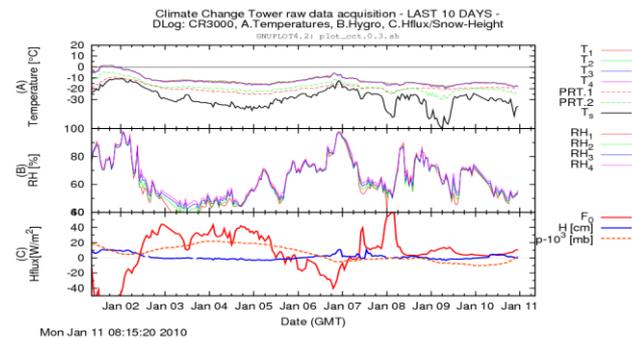


**Photo 4:** The radiometers for upwelling and downwelling flux measurements



**Photo 5:** Setup near the surface of the lowest two meteo sensors

Photo 6 shows the plot of some parameters measured in the last ten days. These information can be seen at the site <http://www.isac.cnr.it/~radiclim/CCTower/>



**Photo 6:** Example of plots of the the real time data acquired by some of the CCT sensors.

### Addressing black carbon and albedo variability with an Unmanned Aerial Vehicle based from Ny-Ålesund spring 2009

In May 2009, a team of scientists from Norwegian Polar Institute, The Norwegian Institute for Air Research (NILU), and Norut visited Ny-Ålesund for an initial 'shakedown' campaign for the project Variability of Albedo Using an Unmanned Aerial Vehicle (VAUUAV). Our overall project goal is to measure the variability of albedo and black carbon over a range of scales over snow and ice covered surfaces. Albedo is simply defined as the ratio of reflected to incoming solar radiation and is has a significant role in determining the energy balance and hence snow and ice melt in the Arctic. Black carbon (or soot) particles are emitted by fossil fuel and biomass combustions, mostly at lower latitudes, but some of the particles are transported to the Arctic where some deposit on the snow and ice and reduce the albedo. The climate effect of BC particles transported to the Arctic is potentially large because of the sensitivity of surface albedo changes to snow and ice albedo feedback mechanisms.



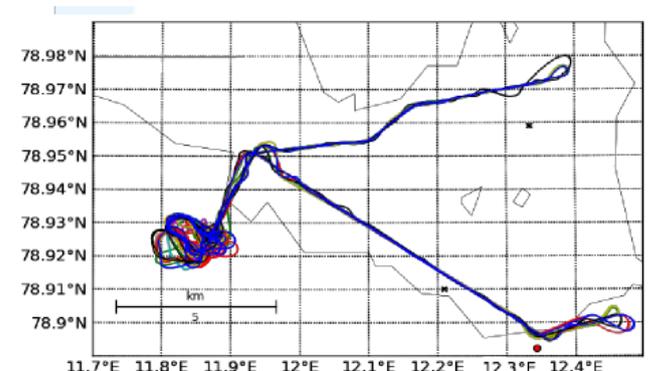
We used an Unmanned Aerial Vehicle (UAV) equipped with two spectrometers, supported with measurements from identical instruments on the ground, as our measurement platform. The measurements took place from 4 to 24 May, 2009. During the first week of the campaign the “ground team” focused on making measurements of value for satellite inter-comparison, as well as inter-comparison of all the campaign instruments. The measurements were focused on three areas: on the tundra

below Brøggerbreen, on Holtedahlfonna and on the sea ice in Kongsfjorden. From the 15<sup>th</sup> of May, UAV flights were taking place more regularly, and in total over 500 km were flown. The science team completed the first successful flight over Kongsfjorden 17<sup>th</sup> of May. Providing favorable weather, this day will also be useful to validate satellite measurements, and was one of several clear-sky days for which we have measurements. On each flight day, the ground team was making concurrent measurements as the UAV flew overhead.



The 2009 campaign experienced challenges, typical of an initial deployment, which providing valuable lessons and opportunities for subsequent campaigns. Despite the challenges, we were able to make a number of successful flights and had numerous opportunities for ground based measurements that will provide the basis for determining the variability of albedo across a range of cryospheric conditions, and be valuable for direct inter comparison with satellite derived measurements.

In spring and summer 2010 the science team will continue to Summit, Greenland, were regular UAV flights supported by ground stations, will be measuring albedo over a 3 month period. In 2011 the VAUUAV project will return to Ny Alesund for an additional extended campaign. The VAUUAV project is funded by a NORKLIMA III grant from the Norwegian Research Council. The Norwegian Institute for Air Research is leading the collaborative effort. For more information, check out the project webpage <http://transport.nilu.no/projects/vauuav>



**Figure 1:** All of the flight tracks during the campaign. Note the repeatability of flights over Kongsfjorden.

by J. Burkhardt<sup>1</sup>, C. A. Pedersen<sup>1</sup>, S. Gerland<sup>1</sup>, W. Bogren<sup>2</sup>, R. Storvold<sup>3</sup>, and the VAUUAV Science Team.

- 1) Norwegian Polar Institute, Tromsø, Norway;
- 2) Norwegian Institute for Air Research, Kjeller, Norway;
- 3) Northern Research Institute, Tromsø, Norway

## Visiting Ny-Ålesund via the web

With more than 30.000 tourists on 200 inhabitants, Ny-Ålesund is a major tourist destination. The bigger the boat, the more restricted are the visitors in their movements. The information which they can obtain during their visit has improved tremendously with the opening of the information center, but there are very few opportunities to learn more about the inhabitants themselves or about their work.

In an effort to present the Ny-Ålesund community, the website of the Netherlands Arctic Station ([www.arcticstation.nl](http://www.arcticstation.nl)) shows new information. You can contribute yourself to this. During your working period in Ny-Ålesund you can enroll yourself or your research project as inhabitant of Ny-Ålesund. You have full control over the displayed information and can manage your own information. Last summer half of the inhabitants did join but at the moment the town seems empty with only 5 visible people.

And there is more. Since Ny-Ålesund appeared out of the blur on Google Earth, it has become possible to make a tour through the village and it's vicinity on ground level. The streetview-styled pictures are supplemented with YouTube video's taken on different locations. Bring your information in a georeferenced frame and link the page with your personal video to your own website. There are still many locations, which could become more informative if there would be video's from those spots. Please consider making your own YouTube video part of this display. An overview of all videos can be found under [hot spots].

Finally, there are maps and aerial photographs which do present you with data on all buildings and installations. Maybe this is all of some interest for ourselves, it is certainly for those people who are unable to travel north but still would like to learn about all aspects which make Ny-Ålesund into a world-class research facility.

Visit: <http://www.arcticstation.nl> and continue with the button [ny-ålesund].

For comments, contact: [m.j.j.e.loonen\(at\)rug.nl](mailto:m.j.j.e.loonen(at)rug.nl)

*By Maarten Loonen, UoG*

## NSINK news

There has been a flurry of activity by NSINK members in Ny Ålesund over spring and summer 2009 that will be continuing in 2010, as we trace the fate of nitrogen from its atmospheric deposition, preservation in the ice-core record, snow and glacial processing, to the impacts on ecology as identified from lake sediment cores, catchment- and plot-scale studies and ecological modeling.

To ensure effective collaborations between the research scientists, who are specialists in a range of disciplines, are based at Institutes across Europe, and of wide-ranging international backgrounds themselves, NSINK arranges frequent cross-group meetings. Our most recent was in January 2010 in Uppsala, Sweden, where we were joined by new PhD and Post Doc fellows Sonal Choudhary and Filip Oulehle, who are based at the University of Sheffield and Centre of Ecology and Hydrology, UK, respectively. Such meetings enable us to present recent findings and future research plans, and are essential to ensure we develop good linkages and understanding across disciplines; skills that are key to effective interdisciplinary research. The uniquely multi-national and multi-discipline

setting of Ny Ålesund as a research base also benefits us by promoting such interactions.

NSINK recently published its interdisciplinary research findings in a paper (Hodson et al., Biogeochemistry, 2009, [doi: 10.1007/s10533-009-9384-y](https://doi.org/10.1007/s10533-009-9384-y)), that traces the fate of pollution event in Ny Ålesund. A polluted air-mass was rapidly transported from the UK to Svalbard in June 1999, where rainout caused significant deposition of ammonium and nitrate as well as sulphate. Observations of glacial meltwater ion chemistry showed that the pollution event significantly affected the glacial biogeochemistry of Midre Lovénbreen, inducing elevated subglacial microbial nitrification activity to unprecedented levels. The event N-inputs were characterised using data from precipitation monitoring activities in Ny Alesund and a combination of meteorological analysis and atmospheric chemistry modelling identified the conditions that caused this highly polluted rain event. The paper was also featured as a NERC (Natural Environment Research Council, UK) news-story <http://planetearth.nerc.ac.uk/news/story.aspx?id=603>. NSINK is an EU Marie Curie Initial Stage Training Network Award. For more information, feel free to contact us!

<http://nsinkproject.group.shef.ac.uk/NSINK/Home.html>

NSINK fellows (PhD and Post-Doc): Rafael Kühnel, Mats Björkman, Tjarda Roberts, (Norsk Polarinstitut), Trine Holm, Jakub Zárský, (University of Innsbruck), Aga Nowak-Zwierz, Aimeric Blaud, Arif Ansari, Sonal Choudhary (University of Sheffield), Carmen Vega, Denis Samyn (Uppsala University) Filip Oulehle (Centre for Ecology and Hydrology)

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*By Tjarda Roberts, NPI*

## New director – Kings Bay AS

The board of Kings Bay AS appointed Mr. Roger Jakobsen to be the new director for Kings Bay AS in Ny-Ålesund on Svalbard. He started his job in December 2009, when the former director; Oddvar Midtkandal, retired.

Jakobsen has experience from management in the Norwegian Army. His latest position was as an instructor in joint operations at the Norwegian Defense University College in Oslo.

## 32<sup>nd</sup> NySMAC meeting

The next NySMAC meeting is scheduled to 12 and 13 April in Copenhagen, Denmark.

The dates are set prior to the ASSW2010 and give participants the opportunity to travel to Greenland directly after the meeting.

## Topics from the 31<sup>st</sup> NySMAC meeting

Topics from the previous NySMAC meeting held in South Korea 23 March 2009:

- Exchange of information.
  - Status of monitoring of the local environment in Ny-Ålesund conducted by NILU/NPI/SU.
  - Energy plan for Ny-Ålesund by Kings Bay AS.
  - Working group will produce list of recommendations regarding how to limit impacts of science on the environment.
  - Creating incentives for energy efficiency and minimizing environmental impact in science planning and execution.  
- *A working group will review best practices at the stations and suggest new measures*
  - A folder to visitors and displays in the Information Centre are planned to show highlights on research going on in Ny-Ålesund.
  - Strategies for integration/resource pooling in Ny-Ålesund.  
- *Experiences from marine lab and ARCFAC will be written in a summary report and presented at the next meeting.*
  - Strategies for utilizing the infrastructures more efficiently will be developed.
- What programs should replace ARCFAC were discussed.
  - Status of flagship programs and Ny-Ålesund Science Plan.
  - Preparatory phase of SIOS  
- *Ensure position and role for KIRB in SIOS*
  - EPOCA Phase 2: Planned Activities Summer 2010.
  - Work report from SSF Secretariat.
  - Common user interface for booking in Ny-Ålesund.
  - VLBI2010 - renewal of the activities at the observatory in Ny-Ålesund.
  - Actual state of the CCT-IP and future developments of the Italian activity in Ny-Ålesund
  - 9<sup>th</sup> Ny-Ålesund seminar during 2010.

## Input to Ny-Ålesund Newsletter

If you would like to contribute to future editions of this newsletter, please e-mail [nysmac@npolar.no](mailto:nysmac@npolar.no).

Any ideas or suggestions for topics are also welcomed.  
*Editor: Marit R. Pettersen, NySMAC Secretariat*  
**Next edition: June 2010**



*NySMAC members gathered at the 31<sup>st</sup> NySMAC meeting in South Korea 3-5 November 2009*

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