

Annual Report 2008



Management 2008



*Øyvind Stene
Chairman*

Board

Øyvind Stene, Chairman
Edel Storelvmo, Vice Chairman
Marian Nymark Melle
Jøran Moen
Paul Narum

Deputy members:

Kjetil Storaas Hansen
Kirsti Lovise Slotsvik



*Bo Nyborg Andersen
Managing Director*

Management

Bo Nyborg Andersen, Managing Director

Objectives

In accordance with governmental guidelines and in co-operation with and to benefit Norwegian industry, research, public-sector bodies and Norwegian interest in general, the objectives of the Norwegian Space Centre are to:

- promote the development and coordination of Norwegian space activities,
- co-ordinate the Ministerial interests and needs within space activities,
- prepare proposals for integrated long-term programmes for Norwegian space activities and submit these to the Ministry of Trade and Industry,
- manage Norwegian Space Centre resources and efficiently distribute funding from the Norwegian State and other sources,
- mind Norwegian interests in liaison with space sector organizations in other countries as well as international organizations and contribute to coordinating Norwegian space activities with those elsewhere,
- manage State holdings in space-related companies in the private sector,
- facilitate the meeting of user needs in the space sector

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From the Director

The year 2008 was hectic and eventful for the Norwegian Space Centre and for space activities in Norway.

Internationally, the ESA Council Meeting at Ministerial Level at The Hague in November was one of the significant events of the year, as at it, member countries choose the space programmes in which they will participate in the years to come.

In Norway, preparation for The Hague meeting entailed a major effort throughout the year. Additionally, the EU and the ESA held summit meetings, one informal and one formal, on European space policy and future prioritization. Throughout the year, Norway also negotiated with the EU on participation in the implementation of the European satellite navigation system Galileo.

During the ESA Council meeting at ministerial level, the Norwegian Government's representative pledged NOK 90 million (€10.9 million) support for the ESA optional programmes over the coming 3-12 years. This was less than recommended by the Norwegian Space Centre, so commercially feasible development programmes were prioritized. With that, Norwegian space sectors companies still can get key ESA contracts that will strengthen their competitiveness in the international market.

Norwegian participation in the Global Monitoring for Environment and Security (GMES) programme will

go down in step with the lower ESA commitment. In turn, this may diminish Norwegian use of and influence on the programme.

ESA remains the prime arena for Norwegian space initiatives, and the Norwegian Space Centre devotes considerable resources to following up participation in the various ESA programmes. Moreover, we see that the EU is an increasingly prominent European actor, particularly in politics. Even with a substantial financial commitment in Galileo and GMES, to date the EU contributes only about 10% of the total European space budget. Consequently, following-up EU and bilateral agreements with France and Canada is vital for Norway and therefore constitutes an increasingly large part of the Space Centre's work load.

The Ministry of Trade and Industry and the Norwegian Space Centre together support the Ministry of Foreign Affairs in negotiations with the EU on full participation in the implementation of Galileo. The negotiations were constructive, and in April 2009, the Government agreed that Norway will take part. Participation will entail an investment of about NOK 560 million (€68.1 million). The Norwegian Space Centre regards the participation as vital for the country.

On the national scene, efforts to develop the space industry and space-dependent services continue unabated. It is gratifying that several competitive,

innovative, smaller companies have entered the space sector. At the same time, the Norwegian Space Centre has endeavoured to mitigate the adverse effects of the restructuring of the telecommunications sector. It's encouraging that in the wake of the closing down of large space companies, new high-tech companies have emerged in the tradition that has evolved over 35 years.

The Norwegian Space Centre has seen an appreciable increase in the number of agencies that exploit space in their work. Nonetheless, there remain challenges that must be dealt with to ensure effective intersectorial use of space.

In 2008, work continued as planned on the satellite-based ship information and tracking system using Automated Identification Signals (AIS) from ships, in a project led by the Norwegian Defence Research Establishment (FFI). Launch of the satellite is planned for the third quarter of 2009.

The Norwegian Space Centre is of the opinion that communication and information work is a vital and integral part of its remit. Throughout 2008, external media coverage and visits to the Space Centre's website increased in step with our goals.

Norwegian Space Centre, 31 May 2009



Bo Andersen



From ESA's Ministerial Meeting in Haag. ©ESA

The Norwegian Space Centre is a governmental agency with distinctive responsibilities. It is under the Ministry of Trade and Industry and has an independent Board appointed by the Ministry. It shall serve all public authorities and be an instrument of governmental industry policy. A vision has been drawn up for space activities in Norway:

“In 2015, Norway shall be the country that benefits most from space.”

To realize that vision, the Norwegian Space Centre works according to five main objectives: create growth in national, high-tech industry, meet the needs of society, ensure that Norway plays a leading role in the global market for space-related ground structure, contribute to Norwegian research communities attaining prominent international positions in space research and ensure that the public is well aware of Norwegian space activities.

Membership in the European Space Agency (ESA) is instrumental in attaining these goals. The Norwegian Space Centre supports Norwegian interests in ESA and coordinates national space activities. Cooperation with the EU is vital to Norwegian participation in Galileo, the European satellite navigation system, and in the Global Monitoring for Environment and Security (GMES). Bilateral agreements with Canada, France and the USA also are important for Norwegian space activities.

The Norwegian Space Centre manages national support scheme allocated to support development in Norwegian companies or institutes that aim to position themselves for future space deliveries or for uses of data from satellites. In addition, the support scheme is used to ensure infrastructure vital to society.

Moreover, the evolution of space activities is instrumental in supporting the Government’s key priorities, including the High North Strategy and the Maritime Strategy initiatives. These initiatives can be brought about only with an appreciable commitment in

Earth observation, satellite navigation and satellite communication.

Space industry and technology

Space activities comprise a prominent sector of the national economy. In 2008, the turnover of goods and services in the space sector amounted to NOK 5.2 billion (€632.6 million), of which 72% were to export. Further growth depends on increased commitment, both public and private.

Satellite communications accounted for nearly 70% of the space-related turnover in Norway. Changes in ownership created challenge as well as potential for innovation, with possibilities for developing new products and founding new companies in user equipment and services.

Some smaller high-tech companies that arose in research communities as well as specialized defence and oil sector companies have successfully developed space-sector niche products.

In November 2008, at the ESA Council meeting at ministerial level in The Hague, the member countries agreed on the future activities in which they would be bound to participate. Norway agreed to commit at a level lower than at the last ESA ministerial

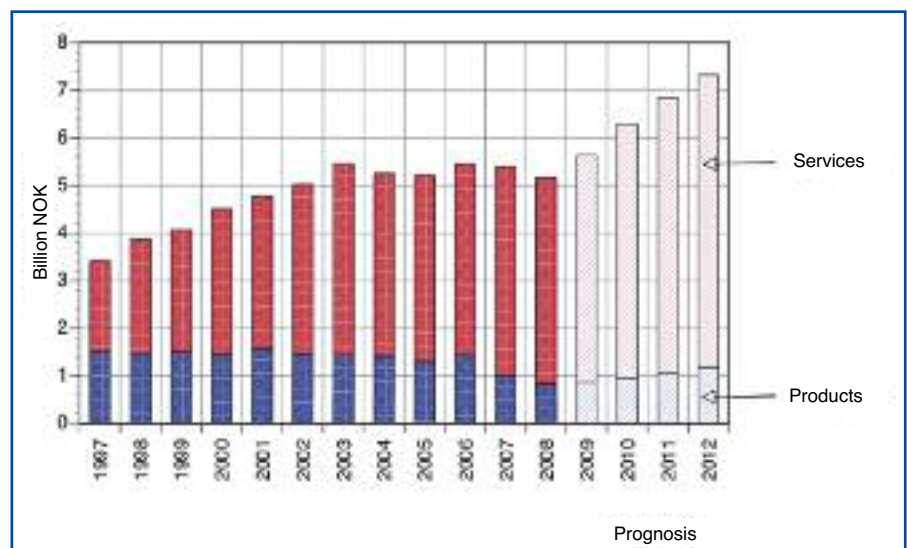
meeting in 2005. Consequently, for the next few years, the Norwegian Space Centre must prioritize short-term technical development at the expense of application programmes that require long-term financing.

In 2008, the total Norwegian commercial deliveries to ESA programmes amounted to about NOK 185 million (€22.5 million).

The General Support Technology Programme (GSTP) is the pivotal ESA technology programme. By the end of 2008, Norwegian companies had entered GSTP contracts for nearly NOK 50 million (€6.1 million). The contracts triggered a total of more than NOK 30 million (€3.6 million) in company self-financing.

In 2008, the Norwegian Space Centre support scheme amounted to NOK 36.6 million (€4.5 million), of which NOK 8.5 million (€1 million) was allocated to preparations for a Norwegian AIS satellite, NOK 14 million (€1.7 million) to industrial developments, NOK 9.5 million (€1.2 million) to developing services, principally in Earth observation and navigation and NOK 4 million (€487,000) to science, technology development and educational development.

Figure 1. Turnover of Norwegian-produced goods and services, from 1997 to 2008. The Figure is based on information obtained by the Norwegian Space Centre from about 40 Norwegian space sector companies. Company forecasts up to 2012 are shown shaded. The decline of turnover of products from 2006 to 2008 is due to the sale of one major company to a foreign buyer and to the close down of another.



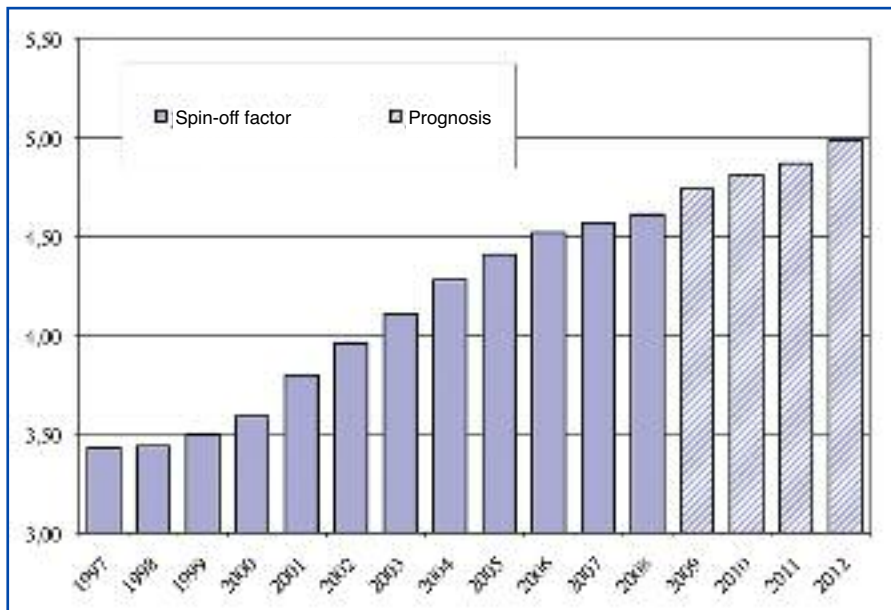


Figure 2. The spin-off factor is a measure of the effect of Norwegian space commitment through ESA and national support programme funding. The Figure is based on information provided by 26 companies and institutes in Norway.

The spin-off effect factor continued to climb in 2008, to 4.6, as shown in Figure 2. This means that for each million of governmental support through ESA or the national support scheme, space-sector companies have on the average attained an additional turnover of 4.6 million.

In 2008, the total Norwegian commercial deliveries to ESA programmes amounted to about NOK 185 million (€22.5 million).

The international space station and space transport

The international space market has recovered after a decline in the early 2000s. In 2008, there were six successful Ariane 5 launches. Norwegian subcontracting to the Ariane 5 launch vehicles includes mechanical structures, thrusters and electronics for a total of nearly NOK 10 million (€1.2 million) per launch.

Norwegian commercial participation in the evolution of the Space Station has been mostly in logistics and in software development. In recent years, Norwegian companies also have taken part in the development of payload modules and of technologies associated with uses of the Space Station.

Satellite communications

The satellite communications sector in Norway is in a readjustment phase. Both established and new companies have initiated activities based on expertise built over several decades, principally in product development and services. Co-financing of research and development is vital in the initial phase of a venture.

Norwegian firms are advanced in applications and commercial uses of satellite communications. Inexpensive, user-friendly ground equipment as well as new services and applications promise to be commercially practical and to have long-range public benefit.

The Norwegian Space Centre has regularly met with satellite communications actors to coordinate Norwegian activities and contribute to ESA programmes. These contacts have built a solid basis for influencing the work of the ESA Joint Telecommunication Board.

The ESA has a series of Advanced Research in Telecommunications Systems (ARTES) initiatives. The Norwegian Space Centre contributes to shaping the programmes and to involving Norwegian industry in them. In 2008, much effort was expended in

shaping a new programme for promoting integrated applications.

Satellite navigation

Galileo is the largest European joint infrastructure commitment and the largest ever EU space project, with an aggregate budget of 3.4 billion Euros. In the autumn of 2008, procurement started with the release of invitations to tender. The first contracts are expected to be awarded in the summer of 2009. According to plan, Galileo will be operational starting in 2013. The implementation contracts are in compliance with the EU Competition Policy, and the ESA has an executive role as the principal contractor delegated by the EU. The negotiations between Norway and the EU on a cooperative agreement for Galileo are in their final phase. The Norwegian Space Centre Galileo Secretariat assists the Ministry of Trade and Industry and the Ministry of Foreign Affairs in this effort. The Secretariat also represents Norway in the European Global Navigational Satellite System (GNSS) Supervisory Authority (GSA) and on the Galileo Security Board, along with the National Security Authority.

Together with GPS, Galileo will be Norway's as well as Europe's primary system for positioning, timing and navigation. With appreciable economic activity and management responsibility for extensive land and sea areas, Norway needs better, more reliable navigational aids. Satellite navigation is a reliable, cost-effective solution.

Greater parts of Norwegian Arctic waters are on the fringe of Galileo coverage delineated by the EU. So Norway must be active in further EU work with Galileo to ensure coverage in Arctic waters equalling that of the rest of Europe. Moreover, Norway must be able to use other Galileo services, including the encrypted, secure service for governmental agencies in EU countries.

Likewise, the competitive ability of Norwegian companies must be ensured by their having full access to competitively tender for Galileo contracts.

Galileo also supports the European Geostationary Navigation Overlay Service (EGNOS) that ensures the quality and reliability of satellite signals. As proposed by the Norwegian Space Centre, in 2006 ESA initiated a project for improving EGNOS in the high north. This resulted in the building of two reference stations, one on Svalbard and one on Jan Mayen, which have accordingly improved coverage.

The Norwegian Space Centre has cooperated with the Ministry of Fisheries and Coastal Affairs on a revision of the national civilian radio navigation plan.

Earth observation

The Norwegian Space Centre's Earth observation activities support coverage of national user needs within public administration and in research. Access to better information on weather, the environment, climate and activities in Norwegian areas has top priority. In 2008, the Norwegian Space Centre focused particularly on the High North.

In 2008, 18 Norwegian agencies or institutes with administrative responsibility used Earth observation satellite data in their work. The data involved came from 16 satellites. The applications ranged from weather forecasting and sea monitoring to locating avalanche hazards and mapping cultural heritages. In 2008, Radarsat-2, the Canadian satellite in which the Norwegian Space Centre has made a long-term investment to ensure access to measurements made through cloud cover, became operational over Norwegian territory.

The Norwegian Space Centre has set up a national group for prioritization of satellite images of Norwegian areas. The Space Centre's SatHav programme continued in 2008. The SatRisk and SatLuft programme initiatives are being built up. In 2008, the Norwegian Space Centre had 18 development contracts with national actors in Earth observation, financed by the national support scheme managed by the Space Centre.

For many years, Norway has been an active, prominent participant in the

implementation of the cooperative European Global Monitoring for Environment and Security (GMES). However, at the ESA ministerial meeting in The Hague in November, the Norwegian commitment to the building of the GMES satellites was far lower than the Norwegian Space Centre recommended figure.

The Norwegian Space Centre has had one of the three European seats on the executive committee of the international Group on Earth Observations (GEO). The Space Centre also has chaired an ESA Earth observation committee in 2007/2008.

In 2008, Kongsberg Satellite Services AS (KSAT) continued to operate profitably and had the main European Maritime Safety Administration (EMSA) contract for oil spill monitoring.

Research uses of space

In all in 2008, 314 research scientists used data from satellites and other space vehicles in their research. That number is relatively stable for "classical space research" comprising exploration of space and research conducted in space. Data downloaded from Earth observation satellites are increasingly used in high priority Norwegian research sectors, such as in the environment, climate, oceanography and the polar sciences.

The ESA scientific programme is a mandatory programme. The launchings of ESA's two large astronomical satellites, Herschel and Planck, were scheduled for 2008 but were postponed until 2009. Extensive preparations have been made in Norway to use the Planck satellite data to study the origin of the universe. In 2008, a Norwegian instrument orbited the Moon on board India's first lunar orbiter.

With the support of the Norwegian Space Centre, in the summer of 2008, a successful campaign was conducted at Andøya with three Norwegian-German sounding rockets to study meteor dust in the atmosphere. A Norwegian sounding rocket was also launched successfully from Svalbard in 2008.

Norwegian scientists played a pivotal

role in the development of the Analyzing Interferometer for Ambient Air (ANITA), an advanced monitoring system for habitat climate that operated on the Space Station throughout the first half of 2008 and was praised by NASA. Moreover, Norwegian research botanists achieved breakthroughs in experiments conducted on the Space Station.

One consequence of the prioritizations that the Norwegian Space Centre was obliged to make at the ESA ministerial meeting in November 2008 was that at this stage, Norway cannot take part in the activities now initiated by the ESA for future missions to the Moon.

The ESA now is building six new Earth observation research satellites, in addition to the more operational GMES satellites. The launch of the first of the six, the Gravity field and steady-state Ocean Circulation Explorer (GOCE), was scheduled for 2008 but was postponed until the spring of 2009 due to problems with the launch vehicle.

The Norwegian Research Council's ROMFORSK ("Space Research") programme has a large unexploited potential compared to the many ESA satellites accessible to Norwegian scientists. In 2008, the Norwegian Space Centre started several projects in the ESA PROgramme for the Deveopment of scientific EXperiments (PRODEX) to enable Norwegian scientific use of these satellites.

Information and education

Four events were well covered in the media in 2008. At a press conference in Oslo in April, the ESA announced recruiting of new astronauts. There was considerable interest in the 80 Norwegian applicants, as well as later in the summer for the news of the selection of Christer Fuglesang for a new space flight. In October, a Norwegian instrument on India's Moon orbiter was featured in the media.

The Norwegian Space Centre was mentioned 759 times in Norwegian online articles, an increase of about

50% over 2007. Visits to the Space Centre's website rose from 130,000 to nearly 200,000. Radio and TV coverage was unchanged at about 80 – 100 features a year. In 2008, the staff reported some 100 to 150 media requests for interviews.

There was a marked increase in the use of the meeting rooms and lecture hall adjoining the Norwegian Space Centre. Professional seminars and lectures drew 1600 guests. A lecture series for secondary school children was well received. In the course of the year, 160 lectures were given in the Space Centre's facility and elsewhere.

The student satellite programme continued in its third year. Some 20 students at the Narvik University College are building the first satellite due to be launched early in 2010. Thirty University of Oslo students have started building the second satellite. A third satellite to be built at the Norwegian University of Science and Technology is being considered. The Norwegian Space Centre finances the programme conducted by the National Centre for Space-related Education (NAROM) and the Andøya Rocket Range (ARR).

In December 2008, the ESA Education Office entered an agreement with NAROM for setting up an ESA Education Office at the Andøya Rocket Range. The Office will offer continuing and further education to Norwegian secondary school teachers, emphasizing the uses of space in teaching. The Norwegian Space Centre took part in the negotiations and will partly finance the operation of the Office.

Managing State holdings in Norsk Romsenter Eiendom AS (NRSE) and Andøya Rocket Range AS (ARR)

The State, via the Ministry of Trade and Industry, owns all the shares in Norsk Romsenter Eiendom AS (NRSE) and 90% of the shares in the Andøya Rocket Range AS (ARR). The Norwegian Space Centre manages State interests in the Andøya Rocket Range AS and Norsk Romsenter Eiendom AS. The Space Centre Board is empowered to appoint the Boards of ARS and NRSE. The Andøya Rocket Range activities are assured through 2010 via the EASP agreement between Germany, France, Switzerland, Sweden and Norway.

Norsk Romsenter Eiendom AS has no staff, and is administered by the Space Centre. The company's activities comprise ownership of the communications link via submarine cables between Harstad on the mainland and Longyearbyen on Svalbard. NRSE also owns half of Kongsberg Satellite Services AS, the other half being held by Kongsberg Defence & Aerospace. The main follow-up activity is the representation on the Board of the company.

For further information, see the ARS, NRSE and KSAT Annual Reports.

Administration and accounts

In 2008, the Norwegian Space Centre accounts showed a profit of NOK 6.2 million (€754,000). Programme activities showed a profit of NOK 5.8 million (€706,000), due

principally to fluctuations in exchange rates in payments to ESA. The operating account showed a profit of NOK 0.4 million (€49,000).

Gender equality and the working environment

As at 1 February 2009, the Norwegian Space Centre had a staff of 21 men and seven women. Management consists of four men and one woman. One woman and one man were hired as trainees for one year starting 1 February 2008

The Board gratefully acknowledges the achievements of the staff and the results attained.

The Space Centre aims to recruit more women to the staff. Increasing the proportion of the staff with minority background also is a goal.

The Space Centre aims to have a positive working environment in which women and men feel comfortable and can realize their potentials and interests. The average length of employment is relatively long, for both women and men.

Board

In 2008, the Norwegian Space Centre Board held five meetings. Total Board remuneration was NOK 330,000 (€40,000).

In June, the Board visited the European Space Research and Technology Centre (ESTEC) in The Netherlands where they gained an insight to European space activities.

Oslo, 31.12.2008 • 14.04.2009



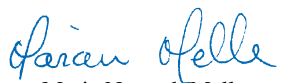
Øivind Stene, Styreleder



Jøran Moen



Paul Narum



Marie Nymark Melle



Edel Storelvmo



Bo Andersen, Adm.dirktør

Figures from profit and loss account 2008

NOK 1000	2008	2007
PROGRAMME ACCOUNTS		
<i>Programme income:</i>		
Programme revenue from Ministry of Trade and Industry	414 300	401 400
Other revenues	10 916	13 234
<i>Total programme income</i>	<i>425 216</i>	<i>414 634</i>
<i>Programme expenses</i>		
ESA, Mandatory basic activities	31 047	31 221
ESA, CSG Kourou	8 517	9 246
ESA, Mandatory scientific programmes	69 891	67 772
ESA, Earth observation	44 889	34 240
ESA, Telecommunications	37 071	80 000
ESA, Navigation	37 932	52 714
ESA, Space station, Microgravity and Exploration	19 785	16 666
ESA, Space transportation	29 224	14 000
ESA, Technology development	74 209	42 172
ESA, Esrange Andøya Special Project	26 682	26 220
Radarsat	5 830	8 807
NSC, National support scheme	32 259	45 314
<i>Total programme expenses</i>	<i>419 328</i>	<i>415 317</i>
PROGRAMME RESULT	5 888	-683
OPERATING ACCOUNTS		
<i>Operating income:</i>		
Operating revenue from Ministry of Trade and Industry	37 054	33 000
Other operating revenues	37 825	40 536
<i>Total operating income</i>	<i>74 879</i>	<i>73 536</i>
<i>Operating expenses:</i>		
Salaries and social expenses	21 465	17 232
Other operating expenses	52 706	53 606
<i>Total operating expenses</i>	<i>74 171</i>	<i>70 838</i>
Depreciation	391	516
Operating profit	317	2 182
Net financial income	65	-85
OPERATING RESULT	382	2 097
TOTAL RESULT	6 270	1 414

€1 = NOK 8.2194, 2008 average exchange rate published online by Norges Bank

Pictorial review of 2008

January



The SCIFER-2 sounding rocket collected data on the aurora and the

solar wind at altitudes up to 1460 km, a new altitude record for sounding

rockets launched at the Andøya Rocket Range. ©Andøya Rocket Range.



Prime Minister Jens Stoltenberg opened the TrollSat station on Dronning Maud Land. It will download data on the environment

and weather in the Antarctic and is part of the Kongsberg Satellite Services ground network for polar-orbiting satellites. At the same time,

the southernmost Galileo system station was inaugurated there.

©KSAT

February

Developed and built in just one year, Thor 5, Telenor's new telecommunications and TV broadcasting satellite, was orbited 36,000 km out in space. It will distribute telecommunications, data communications and satellite TV for the Nordic countries and the rest of Europe. ©Orbital Sciences Corporation



Columbus, the European space laboratory, was attached to the International Space Station. The laboratory has sections for experiments in biology, zoology, space medicine, physiology, materials science and fluid physics.

©ESA/NASA

The new Kjell Henriksen Aurora Observatory was opened outside Longyearbyen on Svalbard. It will spearhead Norwegian work in auroral research and atmospheric physics. ©UNIS/KHO



March



The Jules Verne Automated Transfer Vehicle (ATV), a resupply spacecraft, was launched from French Guiana on a trajectory for the International Space Station. It arrived in April and automatically docked with the Space Station, to resupply it with air, water, food, equipment and clothing for the astronauts in space. ©NASA



Japanese scientists used plant cultivation chambers made by Prototech of Begen to send seeds to the Space Station. The scientists went to the control centre at NTNU to follow the experiments as the seeds sprouted. ©Norwegian Space Centre

April



The European Space Agency began recruiting more astronauts in April. Of the 80,000 Europeans who applied, nearly 80 were Norwegians. No Norwegians were qualified after the first round of selection. ©NASA



Giove B, the second Galileo system experimental satellite, was launched. It will test instruments to be used later on operational Galileo satellites, including an extremely accurate clock ©ESA - P. Carril

May



CNES, the French space agency, visited Svalbard and the Norwegian Space Centre in Oslo, and discussed future cooperation between France and Norway in fields including telecommunications, Earth observation, environment and climate. ©KSAT



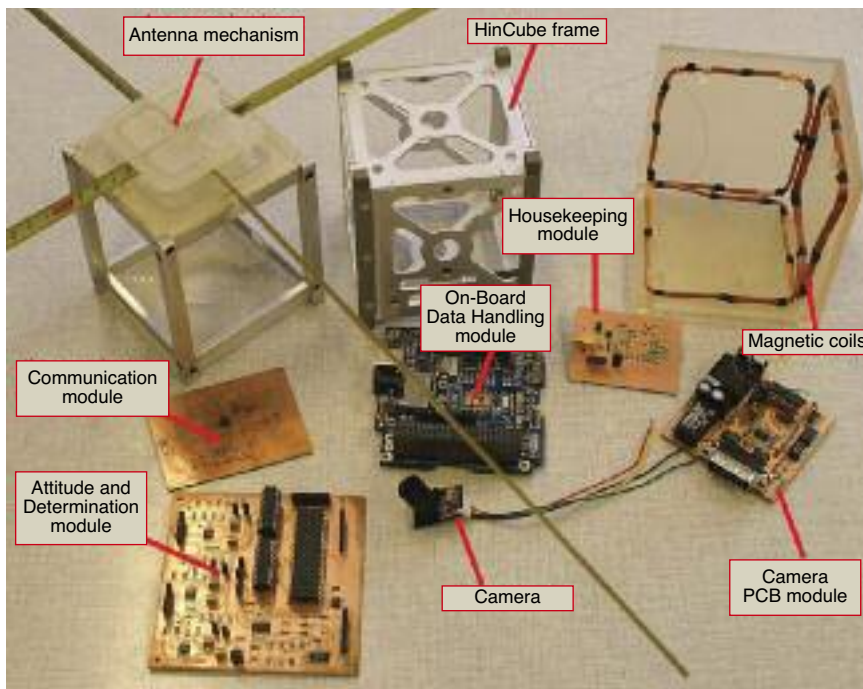
In April, the EU transport ministers agreed on guidelines for the Galileo implementation. In May, Norway began negotiations with the EU on participation in the building and use of the system. Norwegian companies have supplied technology for the Galileo experimental satellites and hope for contracts when the operational satellites are built.

©Norwegian Space Centre



Norwegian archaeologists have made discoveries from space. The pioneering project used satellite data to find cultural heritages in farmlands along the river Numedalslågen. The new methods used have gained international recognition. ©Norwegian Computing Center/Norwegian Space Centre/Directorate for Cultural Heritage

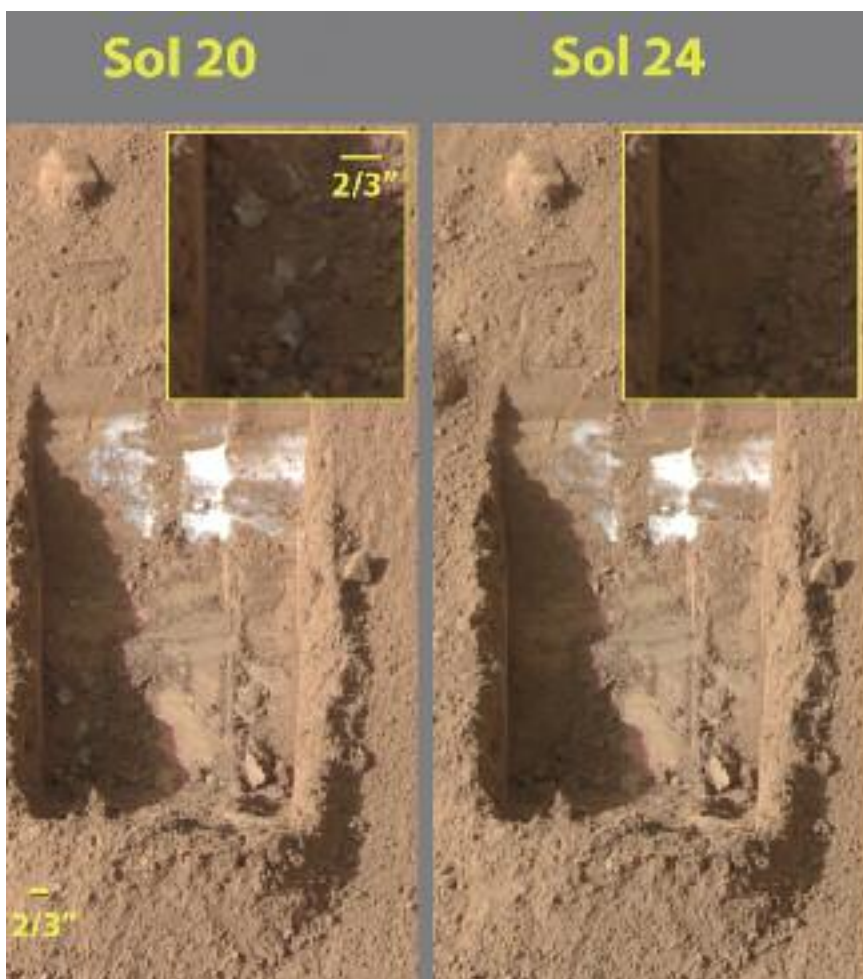
June



The HiNCube microsatellite made by Narvik University College students was selected as a standby project for the first launch in 2009 of Vega, the new European launch vehicle. ©HiNCube-project/HiN



Gamma-Medica Ideas of Fornebu, an Oslo suburb, makes instruments that detect gamma ray bursts in the universe but also are used in breast imaging. In July, the company entered a major contract with JAXA, the Japanese Space Agency, on the supply of detectors for a new gamma ray observatory. ©Spectrum and NASA E/PO, Sonoma State University, Aurore Simmonet



In May, the Mars Phoenix research robot landed near the North Pole of Mars. In June, the robot's digger exposed ice just below the surface. The small chunks of ice at the lower left of the image disappeared in the course of a few days. The uppermost, larger chunk kept better. The images show that there is frozen water just below the surface of Mars.

©NASA/JPL-Caltech/ University of Arizona/Texas A&M University

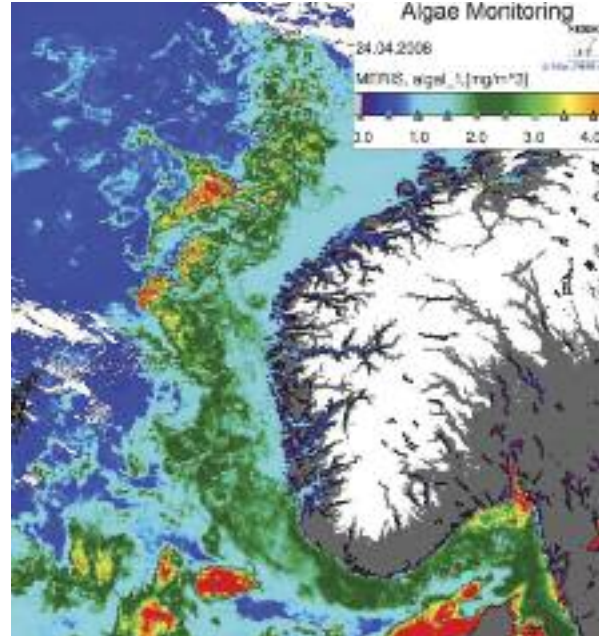
July



The ANITA trace gas monitor, developed mostly by SINTEF, was tested on the Space Station. The test results were so promising that ANITA may be permanently installed in the Space Station and in other space vehicles. ©NASA



NASA celebrated its 50th anniversary. The National Aeronautics and Space Administration was set up on 29 June 1958 to close the gap to the Soviet Union's lead in the space race. ©NASA



Norwegian space research profited in the EU's seventh framework programme. Four of the country's ten applications were selected. Uses of the funds include satellite-based oceanography and air pollution measurement. ©Nansen Center

August

For the first time in 54 years, a total solar eclipse was visible over Norwegian territory. At the Frogner Park in Oslo, the public viewed direct coverage of the eclipse sent by an aircraft over Kvitøya on Svalbard.

©Inge Birkeli/Torben Leifsen/
astronomi.noorion_highres

Space technology contributed to the swimming records set in the Olympic Games in Beijing. Special swimsuits made the swimmers faster than ever before.

©Speedo



Enthusiastic schoolchildren enjoyed the Norwegian Space Centre's summer school, which Trade and Industry Minister Sylvia Brustad visited. ©Norwegian Space Centre



September



South African delegates visited the Norwegian Space Centre to learn about Norwegian work and services in Earth observation. They also looked into the possibilities for space cooperation.

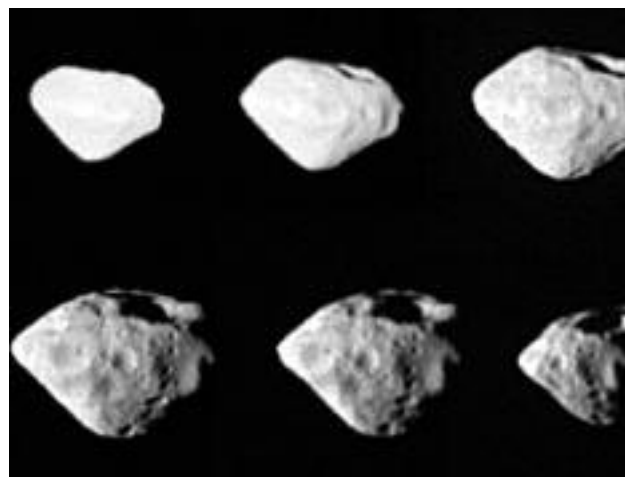
©Jacques Descloîtres, MODIS Land Group, NASA Goddard Space Flight Center



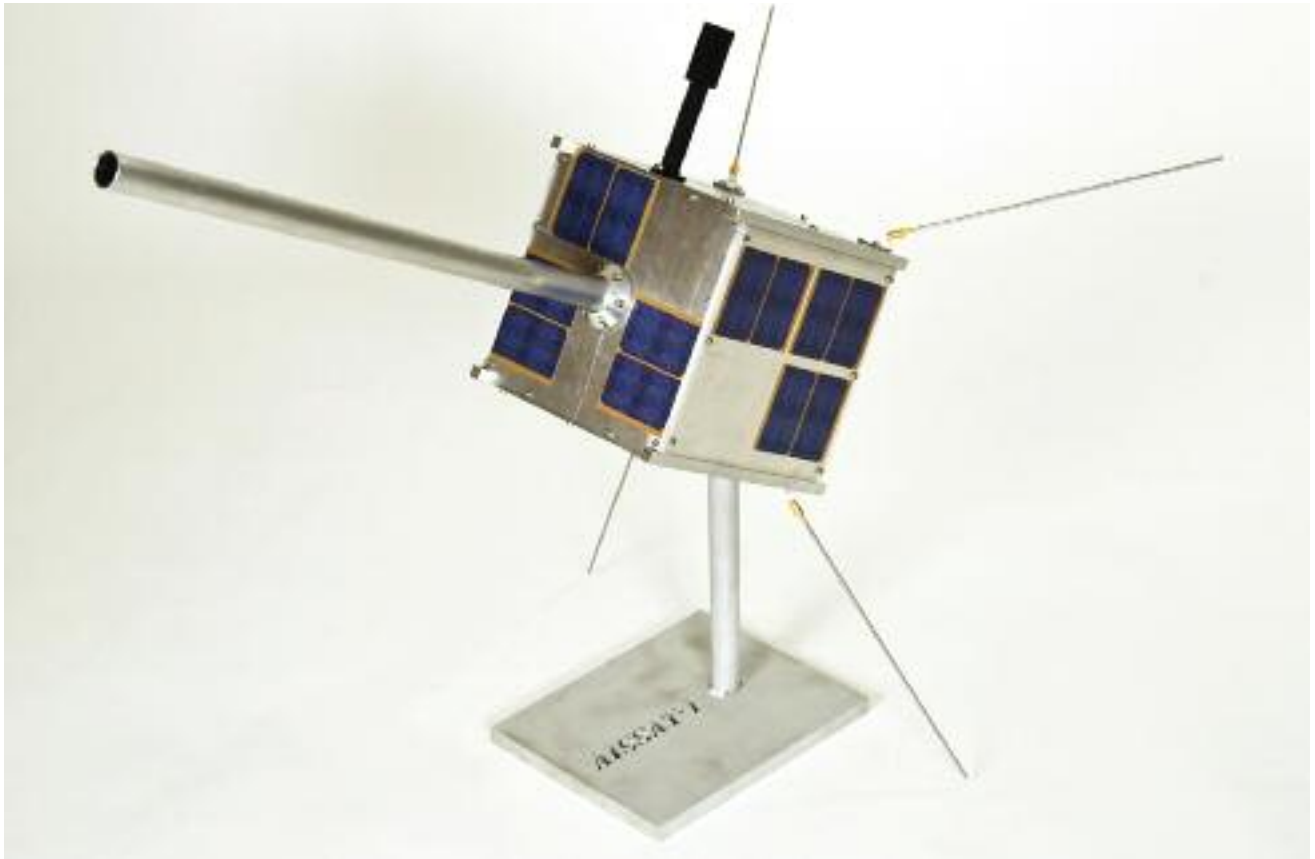
The call of the Jules Verne cargo resupply spacecraft was so successful that its stay in space was extended more than a month. But finally it undocked from the Space Station and made a destructive reentry into the atmosphere.

©NASA Ames/Jesse Carpenter, Bill Moede and Peter Jenniskens

Rosetta, the ESA comet chaser, flew by the 2867 Steins asteroid. Close-up images can reveal details from the birth of the solar system. In 2014, Rosetta will land on the 67/P Churyumov-Gerasimenko comet. ©ESA

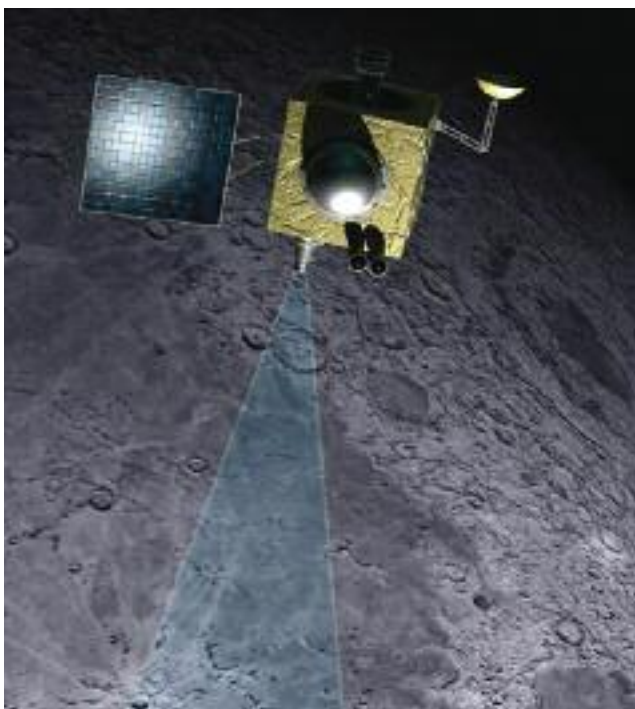


October



The Government appropriated National Budget funds to build a Norwegian civilian monitoring satellite, AISSat-1. It is intended to promote ship traffic safety and assist

navigation and uphold Norwegian sovereignty claims. It will cover Norwegian waters north of Stadt, on the west coast at 62°10'N. ©Norwegian Space Centre



India launched Chandrayaan-1, its first lunar orbiter. The control unit of one of the instruments on board was developed and built by the University of Bergen. Chandrayaan-1 arrived in November and acquired mapping data and information on minerals on the lunar surface. ©ISRO ©University of Bergen

November



©NASA

Tenth anniversary of the International Space Station. The Space Station has been a successful project that has proven

that space research and travel can be truly international. There have been people on board the Station since 2000.

The European space ministers met in The Hague and agreed upon an ESA budget of €10 billion for the years to come. At the meeting, Norway committed €90 million to

new ESA programmes. In November, The Czech Republic became the 18th ESA member country. ©ESA - S. Corvaja



December

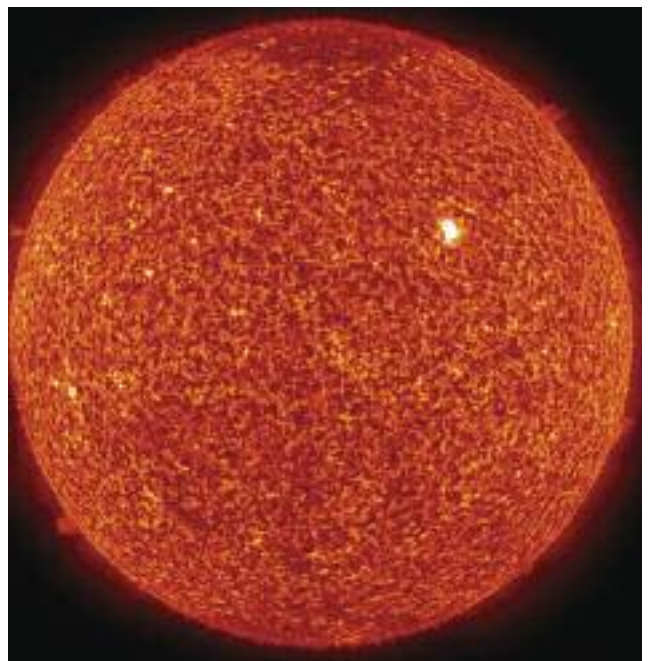


Norwegian scientists launched a nine-metre-long rocket from Svalbard. The rocket attained an altitude of 330 km, went through the aurora and fell into the sea ten minutes

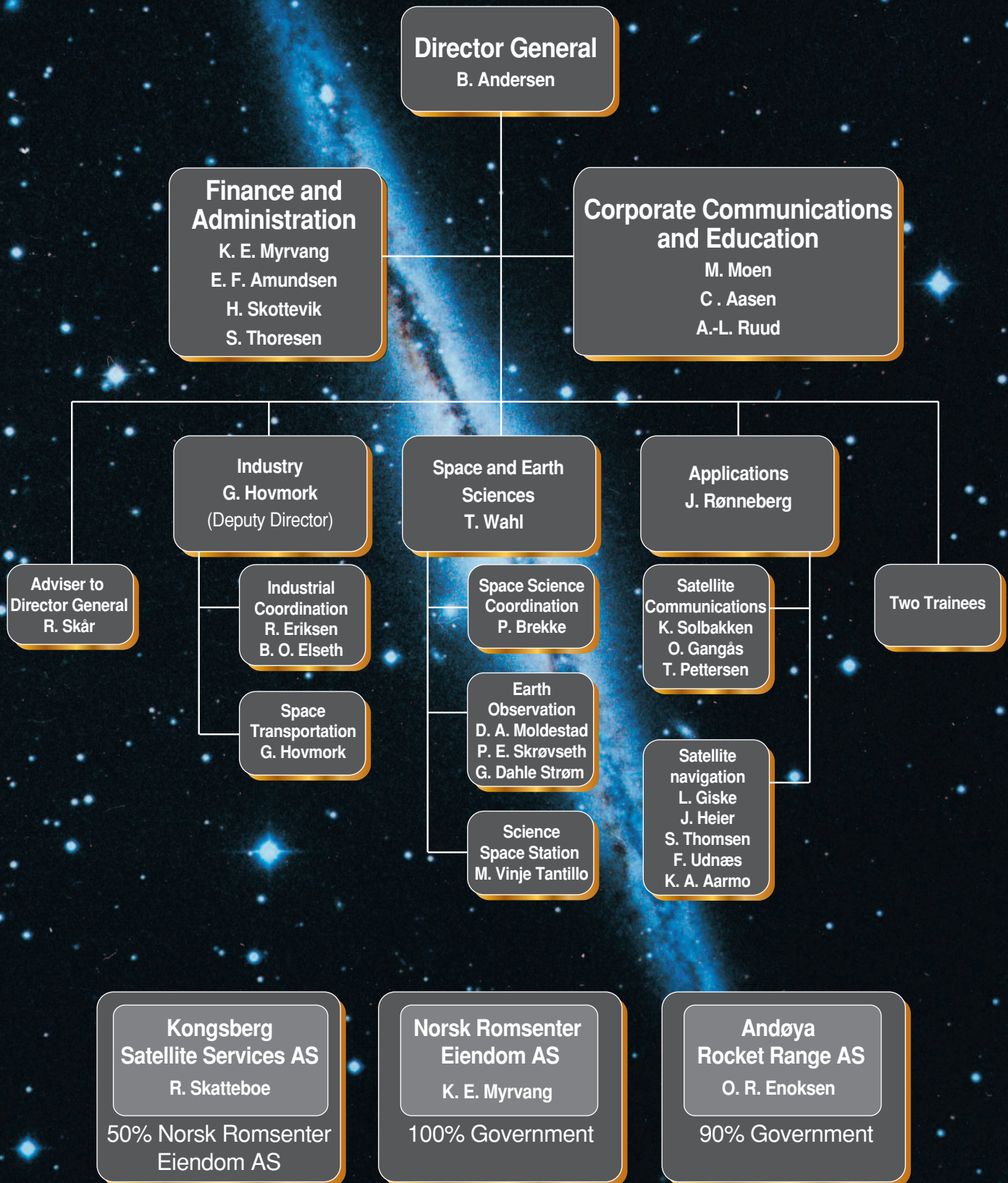
after launch. It carried instruments that acquired data for understanding how the aurora influences GPS satellites and radio signals. ©Preben Hanssen

The EU research infrastructure priority list includes two Norwegian space research initiatives: The Svalbard Integrated Arctic Earth Observing System (SIAEOS) aims to be the leading platform for observing developments in the environment and climate of the Arctic. The EISCAT system, which has two radars in Norway, was also given priority. ©KSAT

The SOHO satellite revealed that a long sunspot cycle fell to a minimum in 2008. The Sun hasn't been quieter for nearly a hundred years. ©SOHO Consortium, EIT, ESA, NASA



Organization of the Norwegian Space Centre as per 1 May 2009





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