



ZAMG Conrad Observatory

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Research

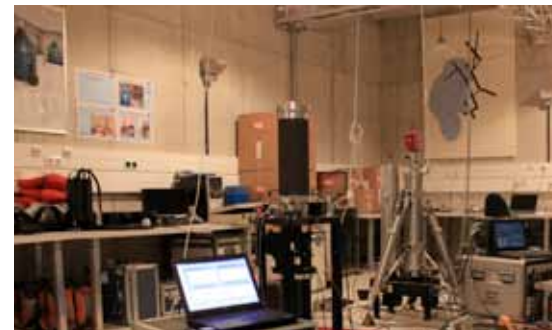
At the Conrad Observatory several laboratories, piers and boreholes are available to facilitate research and development projects. Among those facilities are PC laboratories, boreholes of 50 to 200m depth, special calibration devices for seismometers and magnetometers, and instrumentation for material testing and applied geophysical purposes.

Setup for absolute measurements of Earth's magnetic field at the Conrad Observatory.



All facilities can be used without affecting regular observations. Therefore, the observatory offers the unique opportunity for development and research accompanied by highly accurate geophysical registration. National and international groups are welcome to use observational data as well as instrument facilities.

The infrastructure and technical equipment at the Conrad Observatory presents excellent conditions for workshops, instrument calibration and research projects, as well as development and testing of next generation instruments. Please contact the observatory staff for more information.



The SGO underground laboratory contains gravimeters, calibration devices and control units for geodetic and meteorological observations.

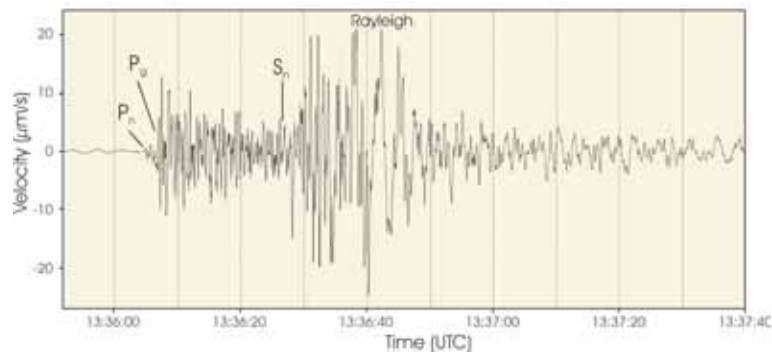
Seismo-Gravimetric Observatory (SGO)



The main seismological station CONA for earthquake observation at the Conrad Observatory.

The SGO contains the main seismological station CONA and a SG GWR CO25 gravimeter. Additionally, several piers and boreholes provide facilities to develop, test and run additional instrumentation.

The SGO consists of a 145m long tunnel and an underground laboratory. At the end of the tunnel four large measurement piers are installed. The last one is occupied by the main seismometer CONA and separated from other experimental facilities by an air lock to prevent disturbances from pressure and temperature variations. The tunnel is held at constant temperature of 6.9°C all year round. The underground laboratory contains a gravimeter used to determine variations of gravitational forces. Furthermore, it hosts control units for geodetic and meteorological observations.



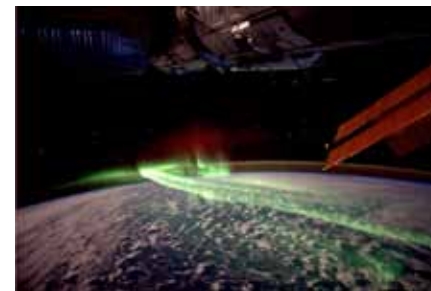
Observation of the earthquake in Bad Eisenkappel (Ml=4.4) on 2.Feb 2013 at 14:35:34, local time, by the main seismological station CONA (Z-component plotted).

Geomagnetic Observatory (GMO)

The GMO consists of a 1km long tunnel system separated from the SGO. The main axis is NS oriented and the laboratory building is located at the south entrance. The main objective of the GMO is measuring long- and short-term variations of Earth's magnetic field. Prominent causes of these variations are magnetic storms (short-term) and magnetic polarity reversals (long-term). The GMO hosts highly sensitive instruments which require an exceptionally stable environment, i.e. in terms of anthropogenic electromagnetic noise and temperature variation. Besides permanent observational installations, a variety of research and development resources are available. National and international research groups find optimal conditions and generous working space in both laboratory and tunnel.



Main tunnel of the geomagnetic observatory.



Over the Southern Lights (Aurora Australis) between Antarctica and Australia on March 10, 2012 by André Kuipers. (©ESA/NASA)

Collaborations

At the Conrad Observatory an infrasound test facility was constructed in 2009. Infrasound waves of very low frequency can travel long distances. Such waves are generated by variations of air volume, and thus have many different natural and artificial sources, e.g. earthquakes, volcanic eruptions, meteorite impacts, lightning bolts, or explosions. The infrasound facility is maintained and used by the comprehensive nuclear-test-ban treaty organization (CTBTO).



Starlike geometric configuration at the infrasound test field located south-west of the SGO.



Due to its unique infrastructure the observatory provides a platform for testing new ideas and developments regarding improvements of weather and climate recording. Among those new developments, which are subjected to long-term testing, is METLIFT operated in cooperation with the University of Vienna.

METLIFT provides accurate measurements of meteorological parameters even in extremely snow rich environments.

The Conrad Observatory hosts research projects from the full geoscientific spectrum. Additionally, national and international conferences, seminars and workshops are held in on-site lecture rooms.



BEV workshop on absolute gravity in 2012 at the Conrad Observatory.

A brief description of the Conrad Observatory

The Conrad Observatory is a geophysical observatory for monitoring important physical parameters of our planet. Amongst these are earthquakes, changes in gravity and mass distribution, geomagnetic field variations, geodetic parameters, atmospheric waves and meteorological data. Observatories such as the Conrad Observatory are characterized by long-term recording in widely stable measurement conditions.

The observatory is named after the Austrian geophysicist Victor Conrad (1876 - 1962), who worked for many years at the Central Institute for Meteorology and Geodynamics in Vienna. It is located 50km southwest of Vienna, Austria, in a nature reserve on the Trafelberg, at an altitude of just above 1000m. The observatory is almost entirely underground and guarantees, among other things, constant temperature for all applied techniques. The range of supported measurement techniques, instrumentation and the layout of the underground facilities at the Conrad Observatory represents a unique research and development location for earth scientists of all disciplines.

The Conrad Observatory includes two main facilities, the seismo-gravimetric observatory (SGO) and the geomagnetic observatory (GMO), and is operated by the Central Institute for Meteorology and Geodynamics (ZAMG).

Entrance to the geomagnetic observatory.

