

A vision of distant worlds **ALMA RADIO TELESCOPE**



The ALMA antenna array at Llano de Chajnantor from the air

The largest radio telescope in the world has been in operation for the past two years in northern Chile. ALMA, or “Atacama Large Millimeter Array”, comprises a network of 66 highly sensitive parabolic antennae which capture signals from space in the millimetre and sub-millimetre range.

The information they deliver enables scientists to gain important insights into the nature of cosmic gas and dust clouds, which have temperatures only a few dozen degrees above absolute zero. To transmit the sensitive signals from the parabolic antennae to the central analysis unit, every antenna

is equipped with cryogenic units operating on an ultra-pure helium circuit. A helium recovery system from BAUER KOMPRESSOREN helps to recover the helium in essential maintenance operations, and thus safeguards the sustainability of this valuable resource.

The site chosen for the radio telescope could hardly have been more extreme. The high plateau of Llano de Chajnantor lies in the harsh environment of the Atacama desert in northern Chile, 5000 metres above sea level. Temperature fluctuations of 40° C between day and night and the thin, low-oxygen air present enormous challenges to people

and materials – but these are the very climatic conditions that provide for successful operation of the telescope. The air is extremely dry and has virtually no humidity, which would mask the wavelengths between infrared and radio waves. The journey from San Pedro de Atacama to the ALMA Observatory is like travelling through a science fiction film set; a forest of white antennae covers the barren lunar landscape of red sand and rocks. The network of interconnected antennae transmit the signals they receive to a central computer, where they are combined and sent to the central OSF (Operation Support Facility).

The technical challenge is to transmit these signals with losses as low as possible. To do this, the receiver units are helium-cooled to a temperature of below 4 Kelvin (-269.15 °C). These extremely low temperatures can only be achieved by using ultra-pure helium. The flushing processes usually involved in maintenance works result in loss of helium – an extremely costly element that is in increasingly short supply. Gi-



Night view of ALMA under the Magellanic Clouds

ven this and the difficulty of delivering supplies to this remote location, an alternative long-term solution was necessary.

The ESO (European Southern Observatory) decided to install a BAUER helium recovery system to make the maximum use of the precious gas. This system collects the helium in a gas bag and recompresses it to 220 bar using a BAUER VERTICUS 5 G100-3-5 high-pressure compressor connected to a P 61 purification. Two B160 storage systems provide interim storage before the gas is reused. Given the challenging environmental conditions, the legendary reliability of BAUER KOMPRESSOREN products clinched the decision to choose a BAUER compressor system – as the on-site Technical Director, Armin Silber, confirmed in an interview at the ESO Center in Garching. ■

At Helenesee Lake with the Kepler-Schule

DIVING – A SCHOOL FOR LIFE

In January 2013 Viola and Joachim Sperling took the stage to claim the “TAUCHEN Award” for the exceptional dedication they showed in the “Tauchen im Schulsportunterricht” (School Sports Scuba Diving) project.

BAUER KOMPRESSOREN, main sponsors of this premium event, were so enthusiastic about the project that they decided on the spot to contribute a sorely needed breathing-air compressor. The portable OCEANUS has com-



The first step is always the hardest – as the students trying to put their flippers on in the water can confirm!

pact dimensions and weighs in at only 46 kilos, yet offers an FAD rate of 140 litres, making it powerful enough to fill divers’ cylinders rapidly wherever they are. Now, two years later, BAUER decided to see how the project was progressing and visited the annual diving expedition held by the Keplerschule at Helenesee lake near Frankfurt / Oder.

Fringed with pine forests and beautiful sandy shores, the sapphire waters of Helenesee Lake glow like a jewel in this picturesque setting. The lake is the location for the diving course which started

with practical training in local swimming pools and theory lessons, and now culminates here with open-water diving expeditions and diving certification.

The Kepler-Schule is located in Berlin’s Neukölln district and is designated a “hotspot school”. In other words, there’s always plenty going on!

Reason enough for Joachim and his wife Viola, both teachers at the school, to initiate the diving project. The disciplined behaviour that is essential during the project is designed to promote mutual helpfulness and team spirit among the participants and to reduce conflicts between different classes and school years.

The students spend the first six months of the course at the swimming pool, initially practising distance diving and handling the basic equipment (fins, mask and snorkel). Only then does the actual diving equipment come into play. The project requires admirable dedication by all those involved; diving teachers and assistants sacrifice their holidays



Joachim Sperling and his students at the morning briefing

and pay for all travel and accommodation costs. The project would not be possible without the generosity of these volunteers and the gift of their skills – or assistance from external sponsors, like Christian Wendt from the Atlantis Diving Centre in Berlin. He supports the project by supplying material, maintenance works, repairs and cylinder filling.

In the morning Joachim briefs the participants on the day's schedule before they gather at the tables in front of the diving centre to prepare their equipment for the dive ahead. The morning is the turn of the CMAS BASIC course members. The diving instructors patiently stand in the knee-deep water with their students, helping them to put on their flippers and checking their equipment before the groups dive in succession.

At the shore, assistant Issa Kayed counts the students as they return and meticulously enters the length and depth of their dives in a notebook. After all, CMAS diving certification has to be earned, and the students are ambitious to do well.

The ten best students from the course will be able to join the school's second diving expedition to Croatia in



Assistant Issa Kayed replacing a filter cartridge on the OCEANUS

the late autumn. Everyone poses for a group photo before I start the car and head back to Berlin.

I have rarely been so convinced that BAUER KOMPRESSOREN's sponsorship has supported such an important and positive project. ■

High performance – great price **THE NEW PE-MVE**

The BAUER MINI-VERTICUS III has always been the first choice for customers seeking a breathing-air compressor with a compact footprint, excellent charging rate and soundproof operation.

Now the new PE-MVE from the POSEIDON EDITION series offers an extremely attractively priced alternative to previous solutions, thanks to a redesign that has enabled BAUER to combine its customers' demand for proven quality and reliability with a smaller basic range of features and functions.

The PE-MVE system is operated by an optional automatic start-stop system – an ideal solution for standalone operation and for applications where the extensive range of control and monitoring options provided by the B-CONTROL MICRO unit are not required.

The filter housing, the optional SECURUS filter cartridge monitoring system and the condensate collection vessel are mounted on the front of the compressor housing for maximum ease of maintenance.

Like the MINI-VERTICUS III, the compressor block has removable doors



The new POSEIDON EDITION MVE

offering access from both sides for easy maintenance work.

Despite its compact dimensions, the most powerful version of the new PE-MVE offers an charging rate of 300 l/min. The PE-MVE has been available since August. ■

Atlantis Diving Center **BERLIN AIR – FROM BAUER**

“Atlantis” is a long-lost submerged city – but it's also the name of two of the most modern and best-equipped diving centres in Germany. So it's no wonder that their equipment includes a BAUER compressor system that enables divers to fill up their tanks with Nitrox as well as breathing air.

I'm expected at the Atlantis flagship



Managing Director of Atlantis, Christian Wendt, operating the BAUER OX filling system

store in Berlin's Mitte district. I park in front of a large, modern flat-roofed building with a banner displaying an underwater landscape over the door. Managing Director Christian Wendt hurries to greet me and leads me through the spacious, bright sales floor. Impressed at its

generous 1400 square metres, I hear that these XL premises used to be occupied by a chain drugstore. Neoprene suits and jackets hang in neat rows, equipment is stacked in shelves and on counters. Customers trying on dry suits are not banished to cramped changing-rooms, but have plenty of space in the separate dry diving studio.

The gleaming filling chamber, as sparkling as a show workshop, is in full view through a wide glass door. This visibility serves customers as a clear indication of trust. The BAUER B-NITROX system is obviously Christian Wendt's pride and joy. The filling concept was devised jointly with BAUER and the compressor specialists and BAUER distribution partner Ing.-Büro für Drucklufttechnik Andrick, based in the Berlin district of Friedrichshain.

Air is brought up to the correct intake pressure in the low-pressure compressor with ROTORCOMP screw unit, and

then stripped of all oil and hydrocarbons in the PURIFICATION MODULE. In the membrane unit, the oxygen level is raised by extracting nitrogen until the desired O₂ level is reached. A BAUER VERTICUS-OX then compresses the air blend to the required filling pressure.

The company's two diving schools at the Baltic Sea also depend on the reliability of BAUER breathing air. And Roger Tours, a travel agent and diving holiday promoter, complements the range of services offered by ATLANTIS for perfect all-round customer care.

For more information, visit:
www.atlantis-berlin.de ■



The joy of diving is apparent from the very first moment I enter the building

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 Ralf Deichelmann

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 Ralf Deichelmann,

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 Annette Adam

Photos
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BAUER Calendar EXHIBITIONS 2015

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Location	Essen
Topic	Fuel Gas Systems
Dates	26.10.-28.10.15

PCV EXPO

Ort	Moscow
Topic	Industry
Dates	27.10.-30.10.15