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MESSER
Gases for Life

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The industrial gases magazine

Gases in science and research

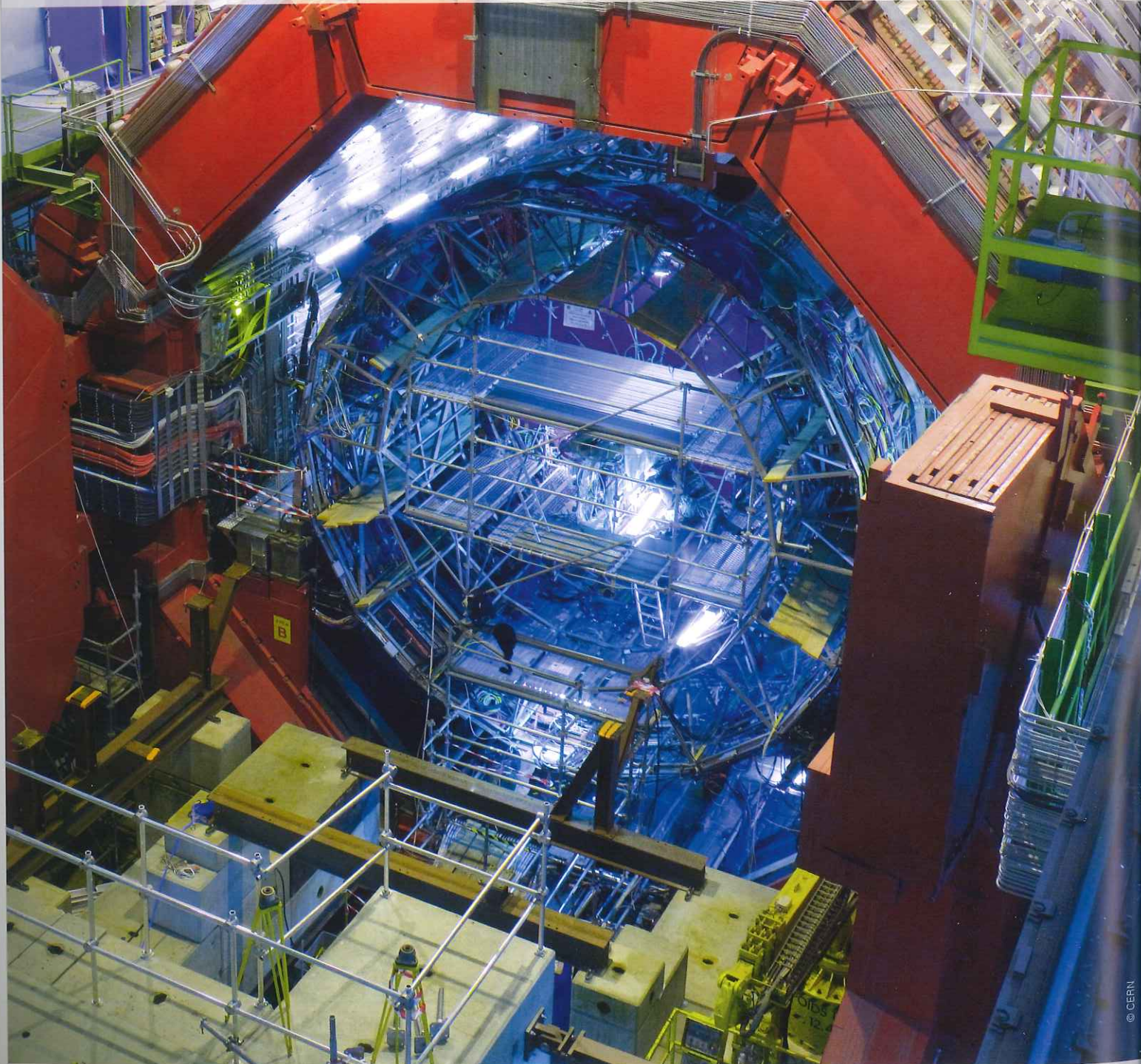
No progress without gases

Welding and cutting:
Focus on Cylinder

Food-grade quality:
Pure bubbles

Transport refrigeration:
Without noise
or exhaust gases

No Progress without Gases



ALICE collides the nuclei of lead atoms, producing temperatures that are much higher than those inside the sun. The aim is to reproduce the primeval soup that came into being just after the big bang.

sion electron microscope, with which the individual atoms of nanomaterials can be made visible. Liquid nitrogen is used to optimise the vacuum in the device and cool the samples.

Rendering residues harmless

Residues of the painkiller ibuprofen and the blood-fat-lowering drug clofibrac acid are deemed to be harmful to the environment. They are widespread and pollute the sewage and waste water. How to dispose of such substances is one of the main areas of research undertaken by the Group of Heterogenous Catalysis from Chemical Engineering Department at Rovira i Virgili University in the Spanish city of Tarragona. "We have found processes to render both substances largely harmless," explains Prof. Sandra Contreras Iglesias. "Such processes always involve converting the organic components to carbon dioxide, water and other inorganic components. Photocatalysis has proved suitable for ibuprofen, and catalytic ozonation for clofibrac acid."

Photocatalysis involves light (photons) and a catalyst acting together to bring about the chemical conversion process. While this also works without gases, the addition of oxygen makes the process much more efficient. Ozonation involves



using the highly reactive oxygen molecule ozone (O_3) to break down the bond of the pollutant molecules. The researchers in Tarragona obtain the ozone from oxygen. Another project also involves the development of a photocatalytic process to remove nitrates from drinking water. These salts pollute the ground water and drinking water primarily in regions with intensive agriculture. Here the efficiency of the purification process is boosted by the addition of hydrogen. Further projects run by the faculty require other gases such as argon, nitrogen or helium as well as synthetic air. The faculty gets the gases from Messer in Spain.

Editorial Team



The applications of analytical processes are extremely diverse, including, for example, engine testing in the automotive industry and process control in the chemical and pharmaceutical industry, in medicine, metallurgy and environmental monitoring. Such methods are used everywhere for process control, quality assurance or in proving compliance with statutory regulations.