



Photo: IRAM/André Rambaud

## The Peak of the Art of Observation

The backdrop is the stuff of a Hollywood film. At any moment, James Bond could ski around the corner to again save the world from some villain or other. In reality, the people who normally spend their time up here – at an altitude of 2,550 meters – have utterly peaceful intentions. In keeping with the spacey ambience, their attention is directed, not at the breathtaking beauty of the French Alps, but at the farthest reaches of the icy-cold universe. Astronomers use the radio antennas on the Plateau de Bure to study interstellar molecules and cosmic dust, observe the birthplaces of stars, travel to distant galaxies or catch sight of black holes at the edge of space and time.

The IRAM observatory currently consists of seven antennas, each measuring 15 meters in diameter. The facility is one of the best and most sensitive radio telescopes worldwide, but that's not enough for the researchers: in the years ahead, five additional 15-meter dishes will be built on the summit, new receivers will be designed and the track systems extended, allowing the telescopes to then be positioned up to 1.6 kilometers apart. The 45-million-euro project is called NOEMA: NORTHERN Extended Millimeter Array. The facility is expected to open up a new window on space and scan the sky with ten times greater sensitivity and four times better spatial resolution than before.

To achieve all of this, the scientists plan to use the full extent of NOEMA's power. They will direct all of the antennas at an astronomical object and then superimpose the millimeter waves they receive. This will allow them to perceive details even from one ten-thousandth of the angle at which the full moon appears in Earth's firmament, guaranteeing deep insights into the cosmic machinery.