

ICARE 2017 SPECIAL CATEGORY AWARD

ALMA OBSERVATORY

PAULINA BOCAZ SPEECH TRANSLATION

AUI REPRESENTATIVE IN CHILE

ALMA RESPONSIBLE INSTITUTION OF ALMAOPERATIONS FOR NRAO

Thank you to the President and the Board of ICARE. Good afternoon to everyone. It is an honor to receive this special category recognition from ICARE on behalf of ALMA, the Atacama Large Millimeter/submillimeter Array, and its partners: the European Southern Observatory, the US National Radio Astronomy Observatory and the National Astronomical Observatory of Japan.

Indeed, as already mentioned, science has achieved what neither politics nor diplomacy have been able to achieve: to bring together 22 countries around a nonprofit project whose exclusive goal is none other than knowledge. By joining together, the ALMA partners made a dream come true, a dream that is much more than the sum of its parts, both technically and philosophically speaking.

ALMA is a radio telescope that observes the portion of radio waves in millimeter and submillimeter wavelengths. This light (not sound, as many believe when they hear the word “radio”) is invisible to our eyes, but visible to its antennas. While optical observatories observe the radiation emitted from high energy physical processes, ALMA observes the cold Universe, where the stars and planets form. A large collection surface is needed to pick up these weak signals. This requires many parabolic antennas that can combine and work together as a single telescope. This technique is known as interferometry and enables ALMA to act as one giant 16-km diameter telescope!

The power of an interferometer increases exponentially with more antennas. Herein lies the importance of international collaboration. By combining resources, the image resolution and sensitivity of ALMA is unprecedented. The first results are already giving the world something to talk about. ALMA is one of the observatories with the greatest demand for observation time from astronomers around the world. In 2016 alone, there were over 230 top-of-the-line scientific publications, reaching levels comparable to the Hubble Space Telescope and the Paranal VLT. In 2018, we will eagerly await the images of the black hole at the center of our Milky Way.

ALMA is proof that, if countries and their citizens invest resources in science, we can push beyond known limits. To do great things, science needs public support on all levels of society.

Science is development. At ALMA, 85% of the workers are Chileans, from all specialties and professions: from cooks to engineers and astronomers, from housekeepers to mechanics, from drivers to nurses and doctors. We are a multidisciplinary team that puts

its skills at the edge of science.

Chile's clear, dark skies offer the best conditions for astronomy due to its altitude and low atmospheric humidity. By 2025, it is estimated that the country will concentrate 70% of the global observation capacity. Thanks to this, there is an unprecedented transfer of knowledge from the countries of the northern hemisphere to our country. The 10% research time reserved in telescopes like ALMA has turned Chilean research institutions into attractive poles for astronomers around the world who mingle and interact with our students and researchers.

In addition to its impact on astronomy and associated engineering disciplines, ALMA has promoted the development of telecommunications infrastructure with the installation of fiber optics between San Pedro de Atacama and Calama. This provides a digital highway that distributes the data generated by the observatory, and it strengthens the development of academic networks in Chile. On a regional level, ALMA contributes to a fund that promotes productive, social and economic development in the municipality of San Pedro de Atacama, and it supports a Science and English education program in San Pedro de Atacama.

From a more philosophical standpoint, ALMA also represents much more than the sum of its parts. All human beings share the desire and fascination to understand the Universe and we all ask the same questions about our cosmic origin: Where did we come from? And where are we going? There is a certain beauty in the confirmation that we can only address these questions when we collaborate and break down language, cultural and political barriers. It should come as no surprise that the Chajnantor plateau, where the

antennas are located, is a sacred place for the *Lickan Antai* people, whose meaning in the Kunza language is “take-off site”. The inhabitants of Atacama have observed the dark constellations since time immemorial. Anyone who has visited northern Chile on nights with no moon or electricity has seen the stars shine, but has also seen the depth of the dark zones, a sky that appears to have geographic relief. Unlike the constellations of the ancient Greek civilization, which were distinguished by connecting the stars, the Andean constellations draw shapes of animals such as the llama in the dark areas. This is the sky that ALMA studies, the cold Universe where galaxies, stars, planets and even the precursor molecules of life are formed. It is from there, at 5,000 meters above sea level, where we scrutinize the Universe in search of our cosmic origins.

Thank you!