

Memorandum of Understanding

between

Herzberg Institute of Astrophysics
National Research Council of Canada

And

Observatorio Astronómico Nacional, Departamento de Astronomía,
Facultad de Ciencias Físicas y Matemáticas,
Universidad de Chile

related to

The Prototype Band One Receiver for the
Atacama Large Millimeter Array project

15th Jan 2011

A handwritten signature in blue ink, located in the bottom left corner of the page. The signature is stylized and appears to be a name, possibly "J. Huch".

SINCE the Herzberg Institute of Astrophysics at the National Research Council of Canada (NRC) and Observatorio Astronómico Nacional at the Departamento de Astronomía, Facultad de Ciencias Físicas y Matemáticas, Universidad de Chile, (the "Participants") intend to collaborate on a reciprocal basis to further their respective research objectives and have discussed this intent;

Now THEREFORE, based on principles of trust, equality and mutual benefit the Participants have reached the understanding expressed in this Memorandum of Understanding ("MOU"):

Part 1: General Provisions

- 1(a) The Participants will discuss research collaboration in fields of astronomy and engineering of mutual interest, to further the research objectives of both Participants, particularly for the Atacama Large Millimeter Array (ALMA).
- 1(b) Nothing in this MOU will be construed to affect other understandings for cooperation between the Participants now existing or hereafter entered into.

Part 2: Fields of Research Collaboration

- 2(a) The Participants will collaborate in the general field of astronomy.
- 2(b) The Departamento de Astronomía at Universidad de Chile has obtained, through the Basal Center for Astrophysics and Associated Technologies (FPB6), funding for the development of a prototype Band 1 receiver for the ALMA project. The Herzberg Institute of Astrophysics (HIA) has developed the Band 3 receivers for the ALMA project and has expertise that is directly relevant to the development of the Band 1 prototype receiver. The specific subject of research in which collaboration will take place is the development of technology suitable for the Band 1 project.

Part 3: Development of Research Collaboration

- 3(a) The Participants may carry out research collaboration through some or all of the following activities:
 1. joint cooperative research projects on key design elements of the prototype Band 1 receiver:
 - a. low noise cryogenic amplifiers
 - b. orthomode transformers
 - c. mixers
 - d. optical design;
 2. exchanges of scientific and technical information for the Band 1 project:
 - a. on the subject of ALMA documentation requirements
 - b. systems engineering;
 3. visits and exchanges of scientific and technical personnel; and
- 3(b) Other forms of research collaboration, in addition to those activities described above, may be determined through consultation.



Part 4: Consultation

- 4(a) For the purposes of effective implementation of this MOU, the Participants will consult in person or in writing through designated representatives whenever necessary to review the activities undertaken pursuant to this MOU and to identify new ones that may be undertaken for the mutual benefit of both Participants.

Part 5: Intellectual Property

- 5(a) Should activities within the scope of this MOU lead to the creation of intellectual property, the Parties will decide in advance in a separate collaborative instrument as to the ownership and disposition of those rights.

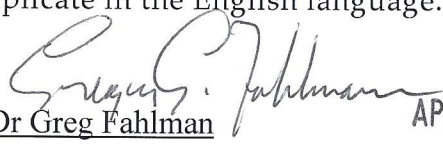
Part 6: Term of This Memorandum of Understanding

- 6(a) This MOU will come into effect upon signature by both Participants and will continue in effect for a period of five years thereafter, unless terminated prior to that date by either Party. Either Party can terminate this MOU on ninety (90) days written notice to the other.
- 6(b) This MOU can be extended for a further five (5) year term by mutual agreement with the same terms, including the right of renewal.

DONE this 15th day of January, 2011, in duplicate in the English language.


Dr. Francisco Brieva, Dean

For:
Facultad de Ciencias Físicas y
Matemáticas,
Universidad de Chile


Dr Greg Fahlgren

APR 04 2011

For the Herzberg Institute of Astrophysics of the
National Research Council of Canada

Date 15 march 2011

Date 4 April 2011



