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Subject: Support from Callisto France to SKA-France Coordinator for the participation of France in the International Radio Astronomy Project Square Kilometre Array

Madame Coordinator,

The SKA is a landmark international science project of the twenty first century in order to build and operate a radio astronomy instrument with unprecedented sensitivity and accuracy. The project presents a number of significant engineering challenges for the design and realisation of the radio telescope, involving a number of key technologies including radio frequency, signal and data processing and energy generation.

The SKA is a unique opportunity for French enterprises to become involved in the development of innovative technologies, which could also find applications in other domains leading to stimulation of economic development and return on investments.

The SKA radio observatory will eventually include thousands of dish antennas, each equipped with multiple feeds and associated low noise receivers. In order to maximise the sensitivity of the SKA Dish Array it will be essential to use extremely low noise cryogenically cooled front ends. Using cryogenically cooled front ends will allow the number of dishes needed to be minimised to achieve the performance targets, thus cryogenic engineering is a major technology area for the project which will be a driver in limiting the overall cost of the dishes themselves as well as the corresponding signal transport, signal processing, computing, infrastructure and the operating and maintenance costs. However, cryogenic systems can have a significant cost impact in terms of energy consumption and through life maintenance. Getting the right cryogenic solution is a key to the success of the project.

Callisto, a PME located in the region of Toulouse since 1995 and a member of the Pole de Compétitivité Aerospace valley, has been working for over 20 years in the application of cryogenic technologies for ultra-low noise RF applications. Callisto is both a technology integrator and technical services provider in the sectors of radio-astronomy and ground

station antennas, for clients such as the European Space Agency, BKG (The German Institute for Cartography), the Indian Space Research Organisation and the Centre National d'Etudes Spatiales. In early 2012 Callisto was engaged by the SKA Project office to undertake a preliminary feasibility and design study into the cryogenic receivers for the SKA Dish array. The results of this study have been published on the SKA Organisation web site and is a reference document for the SKA1 system design. Callisto would like to participate in the SKA project as a consortium member for the SKA Dish Array. However, up to now this has not been possible as France was not a member of the SKA Organisation.

French Scientific Institutions and French industry have unique capabilities and experience to offer this international project. Callisto can play its part along with other French based World leaders in Science and Technology. For this reason, Callisto has participated in the technology workshops organised by Coordination SKA-France, in order to work with the research organisations and other enterprises in order to build the “solution SKA France”.

As a consequence, I have the pleasure to confirm to you the interest of Callisto in the SKA project. We are ready to participate and engage our own resources along with other French partners, in contributing to the development of technologies and equipment which would be used for the SKA project. This can be achieved via public private partnership, internal research projects or collaborative programmes (national, European or international). Based on the “juste retour” principle, only if France becomes a member of the SKA Organisation Callisto will have the possibility to apply to join the SKA Dish Array consortium and becoming an active member in the building of the Instrument.

Yours sincerely,

Stephen Rawson
CEO Callisto