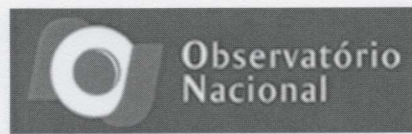


**MEMORANDUM OF UNDERSTANDING
FOR THE
JAVALAMBRE-PHYSICS OF THE ACCELERATED UNIVERSE
ASTROPHYSICAL SURVEY**



Fundación Centro de Estudios de Física del Cosmos de Aragón



Observatório Nacional, Rio de Janeiro



Instituto de Astronomia, Geofísica e Ciências Atmosféricas da Universidade de São Paulo



Instituto de Astrofísica de Andalucía-CSIC



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BY AND BETWEEN

The Centro de Estudios de Física del Cosmos de Aragón, (hereinafter referred to as "CEFCA") an institution registered in Spain under number G-44227148, whose registered office is at Plaza de San Juan 1, 2 planta, 44001 Teruel, Spain, hereby represented by Prof. Mariano Moles Villamate, in his capacity as Director by virtue of the power conferred by the Estatutos of CEFCA ; and

The National Observatory of Brazil duly organized and existing under the laws of Brazil, with Brazilian Cadastro Nacional da Pessoa Jurídica CNPJ 04.053.755/0001-05, having its registered address at Rua General Jose Cristino 77, Bairro Imperial de Sao Cristovao, CEP 20921-400, Rio de Janeiro, RJ Brazil hereby represented by Prof. João Carlos Costa dos Anjos, in his capacity as Director duly authorized to this effect by the Ministro de Estado da Ciência, Tecnologia e Inovação of Brazil (published in the Diario Oficial da União of 11 June 2013, Seção 2, pagina 5); and

The Instituto de Astronomia, Geofísica e Ciências Atmosféricas da Universidade de São Paulo (hereinafter referred to as "IAG") an institution registered in Brasil under CNPJ number 63 025 530/0036-34, whose registered office is at Rua do Matão 1226, 05508-090, São Paulo, SP, Brasil, hereby represented by Mr. Laerte Sodré Júnior in his capacity as Director by virtue of the power conferred by the Rector of Universidade de São Paulo dated on July 10th 2013 (published in the Diário Oficial do Estado de São Paulo); and

The Agencia Estatal Consejo Superior de Investigaciones Científicas, (hereinafter referred to as "CSIC"), on behalf of its Centre Instituto de Astrofísica de Andalucía (hereinafter referred to as IAA-CSIC) duly organized and existing under the laws of Spain, with Spanish Tax Code Number Q2818002D, having its registered address at calle Serrano 117, 28006, Madrid, Spain, hereby represented by Prof. José Ramón Urquijo Goitia, in his capacity as Vice-President of Organization and Institutional Relations of CSIC duly authorized to this effect by the Presidency of CSIC by virtue of the power conferred by Spanish Decision dated 12 July 2012 (published in the Spanish Official Gazette of 19 July 2012)

CEFCA, ON, IAG and CSIC through its center IAA-CSIC will be referred collectively as "Parties" and individually as "Party".

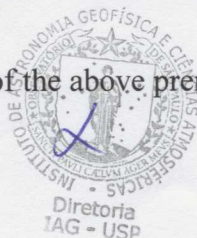
The Parties intervening herein state that their powers to do so remain in force and have not been amended, revoked, or suspended and are sufficient to enter into this Memorandum of Understanding (hereinafter referred as MoU)

PREAMBLE

The CEFCA is building the Observatorio Astrofísico de Javalambre (OAJ) including a 7 sq. deg field, 2.55 m aperture telescope, hereafter T250, and a 3 sq. deg field, 83 cm aperture telescope, hereafter T80, to carry out large-scale surveys within the framework of an international collaboration The first of such surveys to be implemented are the Javalambre-Physics of the Accelerated Universe Astrophysical Survey, J-PAS, an all-sky multi-narrow-band filter photometric survey optimized to measure the scale of Baryonic Acoustic Oscillations using the T250 telescope, and J-PLUS, an all-sky survey, which will use the T80 mainly to provide primarily the calibration for J-PAS.

The Parties have made crucial contributions, both in terms of funding and scientific/technical work, to the development of J-PAS

Therefore, in consideration of the above premises the Parties agree hereby as follows:



I. PURPOSE AND DURATION

A) Purpose

Under the terms of this MoU, the Parties, express their interest to collaborate, on a best effort basis, in:

- i) The construction of a Panoramic CCD Camera, hereafter JPCam, and a First Light, JPCam-Path Finder CCD camera for the T250, and a CCD Camera for the T80, hereafter T80Cam.
- ii) The planning and actual implementation of the surveys.
- iii) The scientific exploitation of the data produced by the J-PAS.

Concerning CSIC, the Parties agree that the terms and conditions of the MoU are only applicable to the CSIC Center IAA-CSIC.

B) Duration

The MoU shall become effective from the date of the last signature and operate for a period of 10 years. This MoU can be renewed for additional terms upon written consent of the Parties.

Notwithstanding any other provisions herein contained, either Party may forthwith terminate this MoU by written notice to the other Parties if either of the following events shall occur:

- (i) In the event that it is agreed by all the Parties that there is no longer a valid reason for continuing, the Parties may decide to terminate this MoU by mutual written agreement of their authorized representatives or (ii) one year prior to the end of the duration of the MoU.

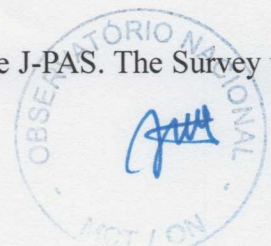
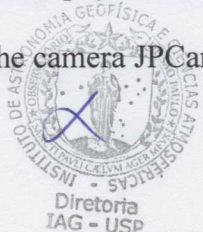
Notwithstanding what is laid down above, the activities that have been agreed by the Parties under the terms of this MoU and are being carried out at the time of notice shall be continued as stipulated until their completion.

This MoU is a refinement of the previously archived temporary MoU, which was signed between three of the Parties (CEFCA, IAG and ON) on October 26th, 2010 and fully substitutes that temporary document.

II. THE COOPERATION

A. Background

1. CEFCA has the responsibility to build the OAJ, with the two telescopes, T250 and T80, and the general infrastructure. CEFCA, as the owner of the OAJ, has the responsibility for the operation and maintenance of the telescopes, the focal plane instruments and the general infrastructure of the Observatory. The infrastructure and human resources for the primary Data Management and Archiving of the data produced by J-PAS is also the responsibility of CEFCA.
2. The proposed science case for the first survey with the T250 telescope is the study of the Dark Energy equation of state through the analysis of the Radial Baryonic Acoustic Oscillations using narrow band photometric redshifts. This survey has been named the "Javalambre-Physics of the Accelerated Universe Astrophysical Survey" or J-PAS.
3. T250, equipped with the camera JPCam will be devoted to carry out the J-PAS. The Survey will



start immediately after the completion and commissioning of T250 and JPCam, foreseen for 2015. The operations for the main survey are expected to require a period of at least 7 years.

4. T80 will be primarily devoted to do the photometric calibration for the main survey with T250 until completion. This is estimated to last for 3 years. The Parties agree on adopting the project J-PLUS as the specific implementation of the calibration project with T80 to maximize the scientific output for other scientific projects, without compromising the central goal of the T80 activity.
5. As long as the OAJ is recognized as an "Instalación Científico-Técnica Singular" by the Spanish authorities, a minimum fraction of 20% of the observing time with T250 and T80 will be offered to the community in a free, competitive regime according to usual rules. A Time Allocation Committee will be nominated to evaluate the applications and to recommend the Director of CEFCA who will allocate the open observing time.

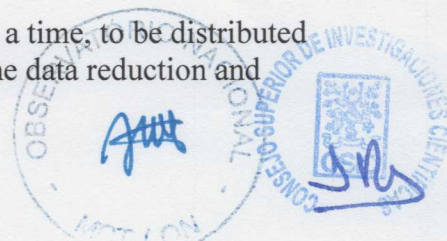
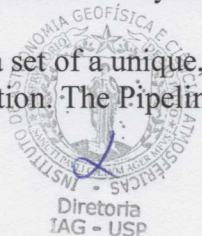
Notwithstanding the interests of J-PAS and J-PLUS will be always preserved in order to complete them in the best conditions and within the foreseen time span.

All the Parties and full members of the Collaboration are entitled to apply for that open observing time.

6. CEFCA, ON, IAG and IAA-CSIC have significantly contributed to the funding necessary to build the cameras. CEFCA, ON and IAG have participated significantly on the cameras concept analysis, development and building with in-kind contributions apart from direct funding. CEFCA, ON, IAG and IAA-CSIC will also contribute to the survey definition and implementation and to the scientific exploitation of the data produced by T250 and T80 for the J-PAS.
7. The responsibility to build JPCam and T80Cam is shared by CEFCA, ON and IAG. The final design will be proposed by the team of the Cameras Project to be agreed by the Collaboration Board.
8. JPCam and T80Cam once finished and commissioned will be deposited at the CEFCA/OAJ, which will have the responsibility for its operation and maintenance. The Cameras' subsystems, which were financed and built by the different Parties, are to be integrated into the completed Camera Systems and will be located at the OAJ under the responsibility of CEFCA to carry out J-PAS, the open time approved programs and associated surveys for as long as there is complete consensus with respect to the use of the subsystems by all the contributing Parties, as represented by those in the Collaboration Board. In any case, the Parties commit themselves to complete the projects J-PLUS and J-PAS in the best conditions and always within the foreseen time spans.
9. The data collected at OAJ will be transmitted in real time to CEFCA headquarters in Teruel. A copy will be stored at OAJ.

CEFCA will produce and host the official versions of the reduced and calibrated (astrometry and photometry) J-PAS data, with the contribution from the other Parties and members of the Collaboration, to produce catalogs with the basic information: multi-band photometry, SED and photometric redshift value for every detected object.

The Parties will agree on a set of a unique, official version of the Pipeline at a time, to be distributed to the rest of the collaboration. The Pipelines and all the software used for the data reduction and



the production of the catalogs will be made available to the Parties, which have the obligation to share any significant innovations or improvements in the basic reduction software, and must periodically make available to each other the latest versions of the software. New versions of the Pipeline have to be approved by the CB prior to distribution and implementation at CEFCA.

The Pipelines and all the software used for the data reduction and the production of the catalogs will be made public when the CB considers it appropriate under the applicable laws and regulations including those described in V.A.

The Parties and all the individual members of the collaboration will have full access to the raw data, to the catalogs and to the calibrated images with only the unavoidable delay caused by the process of data transfer.

The scientific exploitation of the data will be structured in Science Working Groups.

B. Goals and Deliverables

The Parties are committed to achieving the primary goals in this Understanding: (1) the successful deployment of the Javalambre Panoramic Camera, JPCam, a world-class CCD-mosaic astronomical instrument, on the T250 telescope and the Camera for the T80, T80Cam, and (2) the successful completion of the scientific goals of the Collaboration.

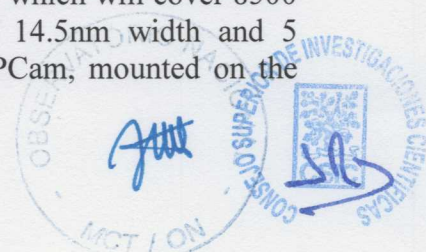
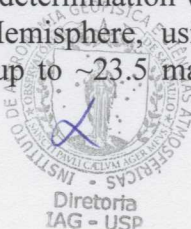
The T250 telescope, equipped with JPCam, will be committed to the J-PAS until completion and the T80 telescope, with its camera, will be committed to the photometric calibration of the main survey.

The responsibility for the primary Data Management Center, Archiving and Pipeline development belongs to CEFCA. ON, IAG and IAA-CSIC are called to contribute from their respective Data Management and Archive Centers (DMACs), already existing or specifically created will collaborate with and complement the work of the main Data Management center at CEFCA. In particular, these centers will develop additional pipeline modules to carry out data analysis for those scientific goals not adequately covered by the main Pipeline, focusing on those areas in which they have more expertise and avoiding unnecessary duplication of efforts.

The official Pipeline will be integrated into the Unidad de Procesado y Archivo de Datos (UPAD), the CEFCA data management system, and it will comply with appropriate interfaces in that system, and be operational as part of that system. The data Pipelines for both Telescopes will provide astrometrically and photometrically calibrated images taken under a well-defined observing mode and the catalogs with the basic information: multi-band photometry, SED and photometric redshift value for every detected object.

The scientific program will have as its main goal the study of the accelerating expansion of the Universe and the nature of its apparent cause, Dark Energy. The Collaboration plans to meet this challenge by measuring the dark energy equation of state parameter, w , giving priority in terms of survey design and execution, to the measurement of the scale of radial Baryonic Acoustic Oscillations (BAO). Other complementary techniques will be also used in the same survey, including but not limited to: (i) the evolution of galaxy cluster counts (ii) weak and strong gravitational lensing and (iii) a SNIa survey.

J-PAS proposes to make this determination with an optical multiband survey which will cover 8500 sq. deg. of the Northern Hemisphere, using 54 narrow band filters of 14.5nm width and 5 medium/broad band filters, up to ~ 23.5 magnitude in each band, using JPCam, mounted on the



T250 telescope. The description of the scientific program, together with the technical and observing time requirements, is contained in "J-PAS: The Javalambre-Physics of the Accelerated Universe Astrophysical Survey", <http://arxiv.org/abs/1403.5237>.

J-PLUS proposes an optical multiband survey covering the same area as J-PAS, using 5 broad band filters and 7 narrow/medium band filters, using T80Cam mounted at T80. The primary goal of the survey is to provide the initial photometric calibration for J-PAS.

The metrics for the successful achievement of the scientific program of the J-PAS will be the area and depth of the Survey and the quality of the images obtained with JPCam. The full commitment of the T250 telescope to those goals is intended to guarantee them.

A 42 (forty-two) month proprietary period for the release of the data outside the Collaboration has been chosen. During the 42 months exclusivity period the Collaboration has exclusive rights to these data. The Parties will give the astronomical communities of countries belonging to the Spain and Brazil access to the J-PAS and J-PLUS data in their DMACs and for a period of 1 (one) year after this proprietary period expires. Afterwards, the Parties will grant the international astronomical community access to their J-PAS data in their Science Archives. A single Data Rights policy agreed by the Parties will apply to all the Science Archives.

C. Mutual Understanding Regarding Resources

The Parties recognize that their ability to meet the commitments to build and deploy JPCam and T80Cam, to implement the Pipelines and Archives and to support the science and operation phases of J-PAS is subject to allocation of funds by their respective funding agencies.

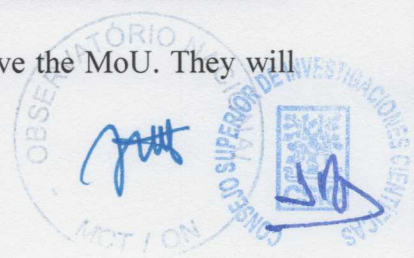
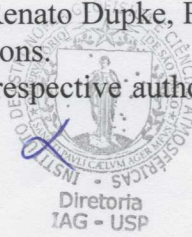
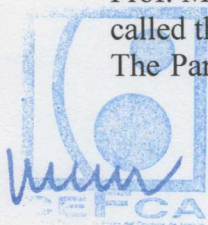
When the ability of one of the Parties to meet its intended commitments is impaired or is likely to be impaired, that Party will inform the other Parties promptly. In such an event, the Parties will develop a practical plan within three months that would sustain the partnership, preserving the scientific goals of the Collaboration to the maximum extent possible, as defined in the Science Requirements Document, and minimize any additional costs that the Collaboration might incur if the Parties agreed to continue the partnership. If the Parties do not reach agreement they will promptly inform their funding agencies and responsible institutions.

D. Project Roles and Responsibilities

The responsibility for the management, execution and oversight of the J-PAS Project at CEFCFA falls on the Director of CEFCFA, Prof. Mariano Moles Villamate, DNI 36.896.979B. The responsibility for the management, execution and oversight of the J-PAS Project at ON is delegated by the current Director of the Observatório Nacional, Dr. João Carlos Costa dos Anjos, to Dr. Renato de Alencar Dupke, Research Scientist at ON, Siape registration 1693951, CPF 861.924.937-15. The responsibility for the management, execution and oversight of the J-PAS Project at IAG is the current Director of the IAG, Dr. Laerte Sodré Jr., Full Professor at the University of São Paulo, USP number 70187, CPF 836.932.038-49. The responsibility for the scientific and technical management, execution and oversight of the J-PAS project at IAA-CSIC is delegated by the current Deputy Vice President, of CSIC, and the Director of the IAA-CSIC, Prof. José Manuel Vílchez Medina, to Dr. Narciso Benítez Lozano, CSIC Tenured Scientist, DNI 20168217T.

Prof. Mariano Moles, Dr. Renato Dupke, Prof. Laerte Sodré and Dr. Narciso Benítez are hereinafter called the Responsible Persons.

The Parties, through their respective authorized representatives, shall approve the MoU. They will



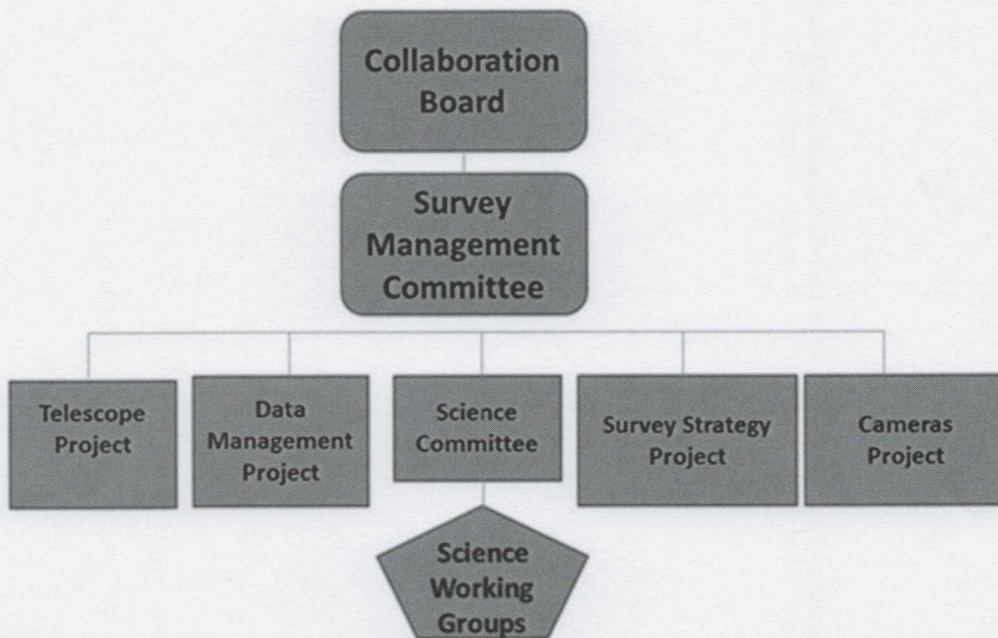
appoint, through their respective Responsible Persons, the Project Science Director and the Project Science co-Director, hereafter the Science Directors. The Science Directors, as such, have no authority to bind or commit the Parties to the terms of the MoU, Collaboration Letters of Acknowledgment, or Projects, and shall not make any representations related thereto on behalf of the Parties, except when previous authorization by the representatives of the Parties is given.

In the event one of the Science Directors positions becomes vacant, the Survey Management Committee (SMC) will recommend a candidate to the Parties, which will be responsible for appointing the successor Science Director (Co-director).

The Science Director and Co-director shall belong to two different Parties, representing the astronomical communities of Spain and Brazil.

III. THE ORGANIZATION AND MANAGEMENT OF THE J-PAS PROJECTS

The J-PAS Projects include the Cameras Project, T80Cam and JPCam, and the Project J-PAS Data Management and Archives (JPDMA). These separate, coupled projects constitute the design, development and building phases of the Survey. In addition, the J-PAS Projects include the installation and commissioning of Cameras at OAJ and their operation during the Survey. They also include the commissioning and operation of the JPDMA System at CEFCA, and the scientific exploitation of the J-PAS data and data products.



The building and operation of the OAJ is the responsibility of CEFCA. It is not included among the J-PAS Projects. Notwithstanding, the OAJ Project will be coordinated with the J-PAS Projects for their optimal development. The OAJ project will be computed as an in-kind contribution by CEFCA to the J-PAS Project.



The authority to carry out the Cameras Project and the Project JPDMA has been delegated to the Cameras Project Manager and the JPDMA Project Manager, by the Collaboration Board. The CEFCA Director has delegated the responsibility of the installation and commissioning of the Cameras to the OAJ Project Manager.

A. The J-PAS Project Organization

The Figure above shows the management structure that is being used by the Collaboration to carry out the J-PAS project and by the Collaboration Board to oversee the J-PAS Project, including their interfaces with OAJ facilities. This structure is also used to organize and coordinate the scientific work of the Collaboration.

B. The Collaboration

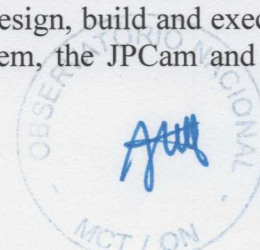
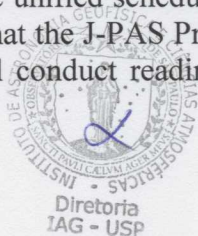
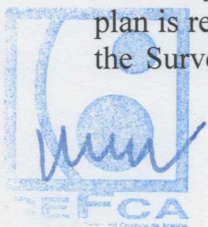
The Collaboration consists of senior scientists from CEFCA, ON, IAG and IAA-CSIC who are accepted as members by the Collaboration Board. Senior scientists from other Institutions, associations or consortia that would enter the J-PAS Project can also become members of the Collaboration with the agreement of the Collaboration Board. Currently, there are scientists from more than 45 institutions that participate in J-PAS (for an updated list of participant institutions please see: www.j-pas.org)

In addition to Members there are Participants in the Collaboration, typically students and post-doctoral scholars from the Parties, or other Institutions, who are mentored or sponsored by Members. The responsibilities and privileges of Members and Participants are defined by the Membership Policy and their admission to the Collaboration is administered by the Survey Management Committee in accordance with this Policy (an updated version of the Policy is given in a separate document).

C. The Collaboration Board

The Collaboration Board (hereinafter CB), is the body which represents the scientific and technical authority of the Parties, as defined above, to carry out all aspects of the J-PAS Projects. It is formed by the representatives of each of the Parties, namely Mariano Moles (CEFCA), Renato Dupke (ON), Laerte Sodré (IAG) and Narciso Benítez (IAA-CSIC). The CB will be chaired by the representative of CEFCA. In general, decisions will be taken by consensus. Otherwise, the decisions will be taken according to a system of double majority, where both the majority of votes by the CB members and the direct weight of each institution with regards to its contribution to the total budget for the J-PAS Project are required in order to have a decision implemented. In this situation, the OAJ and UPAD costs are also computed as material contribution by CEFCA. In case a decision could not be taken, the protocol for conflict resolution described in Amendment VII-A should be followed, keeping in mind that the completion of the J-PAS and J-PLUS projects should always have the highest priority for the CB.

The CB will conduct periodic reviews of the J-PAS Projects, the Project JPDMA and the Cameras Project, and the OAJ Project. The CB will examine the Pipelines, as part of these reviews. These reviews are intended to assure the Parties that (1) the Collaboration can achieve the J-PAS scientific goals with the T80Cam System, the JPCam System and the JPDMA System, (2) that the cost estimates for the three Projects are sound and have sufficient contingency funds to complete the J-PAS Projects, (3) that the unified schedule has a high probability of being met, (4) that the funding plan is realistic and (5) that the J-PAS Project teams are strong enough to design, build and execute the Survey. The CB will conduct readiness reviews of the T80Cam System, the JPCam and the



JPDMA Systems and the OAJ at times they deem appropriate.

D. The Survey Management Committee

The Survey Management Committee (SMC) represents the interests of the Collaboration in all phases of the survey. The SMC is the body to organize, articulate and coordinate all the necessary activities to achieve the goals of the Collaboration. The SMC brings the skills and efforts of the Members and Participants into the Projects and assists the Project Managers in coordinating the contributions of the Collaboration and the Parties.

The SMC will advise the CB on all the matters related with all the aspects of the J-PAS. The SMC will meet periodically. The Science Director will chair the SMC. Each Party is represented at the SMC by at least one Member, chosen by the Responsible Persons. The JPCam Project Manager, the JPDMA Project Manager and the OAJ Project Manager are default members of the SMC.

E. Project Science Directors

The Science Director, together with the Science Co-director, have the overall responsibility for the coordination of the different projects of J-PAS and for carrying out the J-PAS Survey and scientific exploitation. They (i) coordinate the activities at the systems interfaces of the J-PAS Projects and the contributions of the Collaboration for the installation, commissioning and operation phases of the Survey; (ii) serve as the principal point of contact between the SMC and the CB; (iii) represent the Collaboration in interactions with the CB and the Parties and are advised by the SMC on all matters relevant to the Collaboration. The Science Director is the Chair of the SMC.

The Science Directors will develop a unified schedule for the J-PAS Projects from the individual project schedules in order to assure that these schedules are properly coordinated and they will submit it to the CB for their consideration. They will maintain the current lists of J-PAS Members and Participants.

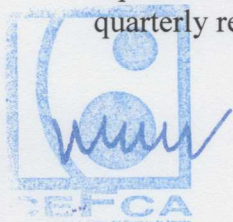
The Science Directors, with the support of the SMC and the agreement by the CB, can propose the appointment of a J-PAS Project Manager in charge of the coordination of the different J-PAS projects, the unified scheduling and the follow up of the progress of each project.

The current Science Director is Dr. Narciso Benítez. The current Science Co-director is Dr. Renato Dupke.

F. The Observatorio Astrofísico de Javalambre

The OAJ T250 and T80 telescopes are currently being constructed. CEFCA is responsible for the building, implementation, operation, maintenance and management of the OAJ. The OAJ Manager is a member of the CEFCA staff. Dr. Javier Cenarro is the current OAJ Project Manager.

The OAJ Project Manager is responsible for preparing and maintaining a full schedule and Working Breakdown Structure (WBS) for the OAJ, which will contain sufficient milestones to allow the Project to be tracked by the SMC. The Project Manager is responsible for preparing quarterly status reports of the project for the Director, who will transmit these reports to the CB as part of the J-PAS quarterly report.



G. The Cameras Project

The Cameras Project includes the conception, building, verification and commissioning of the Cameras for the T80 and T250. T80Cam and JPCam are described in separate documents.

Dr. Keith Taylor (ON), Dr. Antonio Marín-Franch (CEFCA) and Dr. Jordi Cepa (IAC) were appointed as Project Manager and Deputy Project Managers of the Cameras Project, respectively. The Project Manager provides the direct connections between the Cameras Project and the SMC. The Project Manager, together with the Deputy Project Managers, have the responsibility to complete the Cameras Project to the specifications contained in the J-PAS Science Requirements and T80Cam and JPCam Technical Requirements and Specifications documents.

The Project Manager is responsible for preparing and maintaining a full schedule and Work Breakdown Structure (WBS) for the Cameras Project. It will contain sufficient milestones to allow the Project to be tracked from project initiation to completion.

The Project Manager is responsible for preparing the monthly status report for the Project Science Coordinator, who will transmit them to the CB as part of the J-PAS Projects quarterly report.

The OAJ Project Manager and the Cameras Project Manager are responsible for the preparation of the documents on the Installation and Commissioning Plans for the T80Cam and JPCam and for the Operations and Maintenance Plan.

H. The Project J-PAS Data Management and Archiving

The data collected at OAJ will be transmitted in real time to CEFCA headquarters in Teruel. A copy will be stored at OAJ.

The data produced by the J-PAS will be reduced and calibrated for astrometry and photometry to produce catalogs with the basic information: multi-band photometry, SED and photometric redshift value. The raw and processed data will be transmitted to the correspondent Science Data Centers of all Parties within the shortest period as technologically possible. The data will be accessible by all the members of the Collaboration and, after the established proprietary period, to the whole community. The Project J-PAS Data Management (hereinafter referred to as JPDMA) is described in detail in a separate document.

CEFCA has the responsibility for the development of the JPDMA System and Pipelines, under the leadership of Dr. David Cristóbal Hornillos, who has been appointed as JPDMA Project Manager. The JPDMA Manager will be a member of CEFCA staff.

The JPDMA Project Manager, is responsible for preparing and maintaining a full schedule and WBS structure for the project. It will contain sufficient milestones to allow the project to be tracked from initiation to completion. The JPDMA Project will include a series of annual Data Challenges that will allow the Science Directors and the CB to track the degree to which the Project satisfies JPDMA technical requirements. The JPDMA Project Manager is responsible for preparing quarterly status reports of the project for the Science Director, who will transmit these reports to the CB as part of the J-PAS Projects quarterly report.



I. The Survey Science Committee and the Science Working Groups

The J-PAS Science Committee (hereafter Survey Science Committee or SSC) is responsible for the organization and direction of the Science Working Groups (SWGs). The Science Directors have the responsibility to lead and organize the SSC, and will be their Chairman and co-Chairman. They are also responsible for proposing SWGs for each critical science topic and delineating their scope. They appoint the SWGs heads in agreement with the CB. The SWGs coordinators are responsible for coordinating the activities of each SWGs and its internal organization in agreement with the Scientific Directors.

The SSC is formed by the Scientific Directors and the SWG heads. The Science Committee, with input from the SWGs, contributes to the preparation of the J-PAS Science Requirements. It also coordinates the publication of the J-PAS scientific work in journals and conference proceedings and assists in the preparation of funding proposals for J-PAS.

The Science Directors report to the SMC, and ensure the coordination among the different SWGs. Participation in any SWGs is open to all full J-PAS Members, and all Members of the Collaboration have access to all J-PAS data and all scientific data products produced by the Collaboration. External J-PAS members will, in general, belong to only one SWG and have limited Data Rights.

The SWGs are primarily responsible for organizing the work in all the Scientific Areas deemed relevant by the CB, including but not limited to, Baryonic Acoustic Oscillations, Clusters of Galaxies, Weak Lensing and Type Ia Supernovae, and the work on photometric redshifts, simulations and other sciences. They will coordinate the development of these techniques to enable J-PAS to explore and constrain the nature of Dark Energy. Additional SWGs for science projects to optimally exploit the capabilities of the survey in all domains will be proposed by the Science Directors and constituted as required.

The Coordinators of the SWGs are responsible for preparing quarterly status reports of the SWGs activities for the Science Directors, who will transmit these reports to the CB and the Parties as part of the Science Directors quarterly report.

IV. FUNDING FOR THE J-PAS PROJECTS

The OAJ and the UPAD projects are completely funded by CEFCA.

The T80Cam, including the warm and cold parts, is completely funded. CEFCA contributes with funds allocated to the project ICTS2009-14, *Ministerio de Ciencia e Innovación*, Spain, and own resources. ON and IAG will contribute with the funds to complement the CEFCA contribution to cover the total cost of T80Cam.

JPCam costs are currently estimated at 8,000,000.00 USD. At the moment of the signature of this MoU, the Parties have agreed with the following funding contributions. IAA-CSIC has funded 8% of the full estimated costs through the grant *Consolider-Ingenio Physics of the Accelerated Universe*, *Ministerio de Ciencia e Innovación*, Spain. CEFCA is funding 17% of the full estimated costs from its own budget. The ON is contributing 62% of the full estimated costs, directly or indirectly, through approved FINEP grants and also through its own budget. The IAG is contributing 13% of the full estimated costs, directly or indirectly, through approved FAPESP grants. Applications for any remaining funding have been submitted or will be submitted to funding agencies in Brazil and Spain.



In order to provide all of the Parties contributing to the J-PAS Projects an opportunity to monitor the progress of the Projects and to express their commitment to the Projects the CB will convene a Resource Committee to discuss the status of the Projects, the resources needed to carry out the Projects, the resources available to the Projects and the expectations for the near and far future. This committee would meet as needed.

J-PAS Members are expected to prepare and submit individual investigator proposals for the scientific exploitation of the Survey Data to their national funding agencies or philanthropic institutions in accordance with the practices of their Institutions. Prior to submitting a proposal that proposes to use J-PAS data and/or the research products and analysis tools, which were developed by the Collaboration, the proposal PI will provide an abstract of the proposal to the Science Director. The abstract will be posted on the Project Website so that all J-PAS Members and Participants may be aware of proposals submitted by Members. The complete proposal will be available to any member of the Collaboration upon request.

V. APPLICABLE POLICIES TO THE J-PAS

The SMC has the responsibility for the establishment of policy criteria on Intellectual Property, Data Rights, Publication and authorship and Collaboration Membership. The SMC will elaborate the corresponding documents that have to be agreed by the CB. These Policies should be homologous to the current similar Policies in the main astronomical institutions and well established collaborations.

The Parties will require the Survey Management Committee to inform all Members, Participants and their respective Institutions of policies applicable to their participation in the J-PAS Collaboration including, but not limited to, by posting applicable policies on the J-PAS web site.

The following guidelines shall be included into the policy criteria:

A. Intellectual Property

CEFCA grants to each Party a royalty-free, non-transferable, non-assignable, irrevocable right and license to reproduce, distribute and display publicly, in print, electronic or digital formats, data or images obtained by the Parties during the J-PAS Observations on the T250 Telescope for the J-PAS observing program.

The policies of the Parties shall govern ownership of the rights, title to and interests in any patentable intellectual property and copyrightable works, including software, developed, conceived of, or first implemented in practice solely by one or more employees of such Party or Parties.

The Parties shall jointly own rights, title and interests in patentable intellectual property and copyrightable works, including software that is developed, conceived of or first implemented in practice jointly by employee(s) of any of such Parties.

B. Data Rights

Rights to scientific images and data, including, but not limited to, images, databases, catalogs, and scientific works will be determined in accordance with applicable data rights policies.



Notwithstanding the policies specified above, CEFCA hereby grants each Party a royalty-free, non-transferable, non-assignable, irrevocable right and license to reproduce, distribute and display publicly, in print, electronic or digital formats, data or images obtained by the Collaboration during the J-PAS Observations on the T250 Telescope for the observing program described in this Understanding.

C. Publications

The Parties will encourage the J-PAS Members to publish scholarly articles and papers, individually or jointly, and to make presentations regarding the scientific and technical results of the Survey. J-PAS Members will follow the policies on publications that will be established by the CB and the SMC in accordance with the SSC. The publication Policy is detailed in a separate document.

VI. EDUCATION AND PUBLIC OUTREACH

The Parties intend that an integrated Education and Public Outreach plan should be a part of the overall J-PAS Project. It will build on the extensive public outreach and education efforts already underway at some of the Parties and will be aimed at providing scientific information to the general public. A website will be built that will evolve from serving the J-PAS Projects during construction to serving the general public and astronomers during operations.

VII. AMENDMENTS

(A) Conflict Resolution

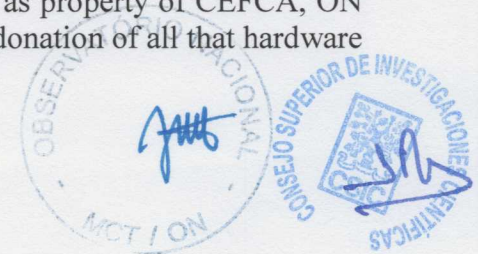
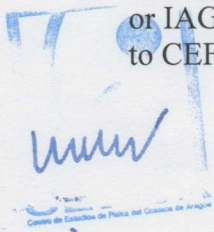
Any amendments to this MoU may be made by a written document signed by the authorized representatives of each Party with the concurrence of the Science Directors.

For the purpose of settling any doubts or disputes that may arise, the Parties shall exert their best efforts to arrive at a solution by consensus. In case there is a standing conflict in the decision making process following the double majority rules (as described in III-C) regarding decisions that, if not taken, may seriously jeopardize the objectives of the Project, the following steps shall be taken. Two more CB meetings shall be scheduled within a reasonable time frame so that the conflicting Parties can present new arguments, points, or evidence that may resolve the conflict. Should consent still prove to be unfeasible, the Parties shall appoint, by mutual consent, a third party or parties (natural person(s)) to act as mediator(s).

Notwithstanding the above, if any of the Parties shows that certain provisions of its national law prevent it from submitting the relevant dispute to arbitration or mediation, the Parties will submit the dispute to the Courts of the defendant.

(B) Hardware Usage

The hardware(s) purchased or developed for JPCam, T80Cam and JPCam-Path-Finder with funds from CEFCA (irrespective of the specific funding source), from ON (directly or indirectly through FINEP or FAPERJ), or from IAG/USP shall be considered as property of CEFCA, ON or IAG/USP, respectively, until such date when a formal process of donation of all that hardware to CEFCA is completed.



As part of the present Understanding, CEFCA, ON and IAG/USP grant the permission for the usage of their hardware items, composing JPCam and JPCam-Path Finder with T250 and of T80Cam with T80, listed in an attached document, under the conditions described in the institutional "Permission of Usage" documents attached, until the donation process is complete or for the duration of the present MoU.

The cameras will be used for the projects J-PAS and J-PLUS and also for the observations granted within the open time.

(C) Penalties

Violation of any of the agreed-upon terms and conditions of this binding document by individual members of the collaboration will be analyzed by the CB, who will apply the appropriate penalties in accord to the level of the contract breach.

(D) Notices

All formal notices of the Parties in relation to this MoU shall be sent by email and confirmed by registered mail or international courier to the following addresses:

Mariano Moles
CEFCA
Plaza de San Juan 1, 2 planta
44001 Teruel
Spain

Renato Dupke
Observatorio Nacional
Rua General Jose Cristino 77
Bairro Imperial de São Cristovão
CEP 20921-400
Rio de Janeiro, RJ, Brazil

Laerte Sodré,
Instituto de Astronomia Geofísica e Ciências Atmosféricas
Universidade de São Paulo
Rua do Matão 1226
CEP 05508-90
São Paulo, SP, Brazil

Narciso Benítez
Instituto de Astrofísica de Andalucía-CSIC
Glorieta de la Astronomía s/n
Granada 18008

Notices made by international courier shall be deemed received by the addressee provided that the sender holds a copy of the delivery receipt furnished by the courier company.





And having thus agreed and covenanted, the Parties hereto execute this MoU in (4) four identical counterparts, in English, to one and same effect.

Signatures

IN WITNESS WHEREOF, the Parties hereto sign the present MoU in four counterparts and with one effect, in the dates indicated below,

For the Centro de Estudios de Física del Cosmos de Aragón

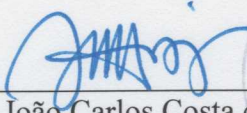




Dr. Mariano Moles, Director

14. 11. 2014

Date

For the Observatório Nacional, Brasil

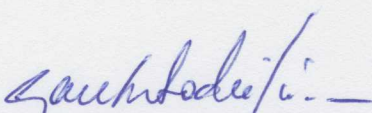




Dr. João Carlos Costa dos Anjos, Director

02. 12. 2014

Date

For the Instituto de Astronomia, Geofísica e Ciências Atmosféricas da Universidade de São Paulo,

Dr. Laerte Sodré Jr., Director

05. 12. 2014

Date

For the Agencia Estatal Consejo Superior de Investigaciones Científicas




Prof. José Ramón Urquijo Goitia
Vice President of Organization and
Institutional Relations of CSIC

4. 11. 2014

Date