

# **Declaration of Intent**

## **on the Pre-Construction Phase**

### **of the Cherenkov Telescope Array**

#### **(CTA)**

#### **Preamble**

The present generation of Cherenkov telescopes has opened a window in the domain of very high-energy gamma-ray observations. The first detailed observations of the sky at TeV energies have revealed galactic sources with complex and resolved structures in the Milky Way as well as numerous extragalactic sources.

The scientific community, which has gained an extensive knowledge with the Cherenkov telescopes H.E.S.S. in Namibia, MAGIC on the Canary Islands, and VERITAS in the United States, has proposed a project for a much more sensitive gamma-ray observatory with full sky coverage in the energy range between several 10 GeV up to 300 TeV, the Cherenkov Telescope Array (CTA).

The CTA Consortium has the ambition to provide the science community with a worldwide unique and technically innovative ground-based Imaging Atmospheric Cherenkov Telescope system, with a high potential for discoveries owing to its largely improved sensitivity and spatial resolution. CTA, as an open observatory, will serve a wide astrophysics community and will provide a deep insight into the non-thermal high-energy universe, enabling scientists to tackle a variety of fundamental open questions concerning supernovae, compact objects such as pulsars and black holes, the galactic centre, star forming regions, active galactic nuclei, dark matter, quantum gravity, charged cosmic rays, and many other subjects.

Most, if not all roadmaps, mention CTA as the coming infrastructure for gamma-ray astronomers, for instance, the ASPERA and ASTRONET roadmaps, the ESFRI roadmap, and national roadmaps of most of the participating countries.

A CTA Preparatory Phase (hereinafter referred to as CTA-PP) with the involvement of a large number of European institutes is currently funded for 3 years (2010-2013) within the Seventh Framework Programme of the European Union.

Based on the very promising developments so far and the size of the collaboration of international partners which involves more than 125 institutes (hereinafter referred to as "CTA Consortium"), the signatories of this Declaration of Intent decided to enter into the Pre-construction Phase of the CTA project (hereinafter referred to as "CTA-PCP").

By signing this Declaration of Intent, the signatories – Ministries and Funding Agencies<sup>1</sup> – wish to express their common interest in participating in the construction and operation of CTA. They agree to work together to develop an international governance structure and funding scheme, and to elaborate all necessary steps towards taking a decision about the

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<sup>1</sup> The Ministries or Funding Agencies may assign a university or research institute to act on their behalf.

participation in the construction and operation of CTA. The present Declaration of Intent is of limited duration and implies no legal commitment - in particular the signing of this declaration does not create any financial liabilities for the signatories for the possible future participation in the construction and operation of CTA.

1.

**Participants to the Declaration of Intent**

The signatories of this Declaration of Intent are Countries represented by ministries, governmental agencies or other institutions suited for this purpose. The signatories are hereafter named "Participants" or individually "Participant".

2.

**Purpose**

The purpose of the Declaration of Intent is:

- (1) To provide the framework for the international co-operation during the CTA-PCP, as defined in the Annex.
- (2) To define the documents to be prepared during the pre-construction phase, to enable the evaluation of the progress of all relevant aspects of the project and to prepare the decision to proceed to the construction phase.

3.

**CTA Resource Board and Advisory Committees**

- (1) The Resource Board of CTA (CTA-RB) oversees the work in the CTA-PCP. It consists of two representatives for each country, representing all institutions of that respective country. The representatives are appointed by the Participants. The CTA-RB shall elect a chairperson and a deputy chairperson, who become *supra partes* and leave their delegations. The Participants affected by these departures appoint replacement representatives for the CTA-RB.
- (2) Potential future Participants, which have not (yet) signed the Declaration of Intent, may send one observer to CTA-RB meetings, upon invitation from the chairperson.
- (3) The CTA-RB advises CTA on major aspects of the CTA-PCP.
- (4) Three advisory committees will be established by the CTA-RB with the following functions:
  - The Scientific and Technical Advisory Committee (STAC) will monitor and evaluate the scientific goals and the overall layout of CTA, including its technical design. It will assess the costs for the construction and operation of the facility.



- The Administrative and Financial Advisory Committee (AFAC) will work out a legal framework and an organizational scheme for the construction and operation of CTA, in close cooperation with the coordinator of the CTA-PP and the relevant CTA-PP work package coordinators.
- The Site Selection Committee (SSC) will assess, and advise on, the criteria and the process for the selection of the CTA observatory sites. The Site Selection Committee will be disbanded after the selection of the sites.

(5) The Advisory Committees will report to the CTA-RB and will work with the CTA Management to:

- Prepare by mid 2013 the elements necessary, and in particular the documents specified in the Annex, for the decision by the interested Participants to construct and operate CTA.
- Discuss the site selection process of CTA.

#### **4.**

### **Centres of the CTA infrastructure**

The CTA research infrastructure is presently anticipated to include several centres. The criteria for the establishment and location of centres are proposed by the CTA consortium and will be decided in the CTA-RB.

#### **5.**

### **CTA management**

The CTA management consists now of the Spokesperson, the Co-Spokesperson, the Chair of the Consortium Board, and the Project Manager. The CTA Management is responsible for the execution of the CTA-PCP according to the policies set by the CTA-RB. The spokesperson represents the present Consortium to the outside. The CTA management structure and composition are already proposed by the CTA Consortium and should be approved by the CTA-RB.

#### **6.**

### **Forms of Cooperation between Participating Institutions**

(1) The CTA Consortium carries out all R&D and prototype work during the pre-construction phase.

(2) Within the framework of this Declaration of Intent, contributions to the design and development of CTA and its components in the CTA-PCP (e.g. personnel and equipment, production of prototypes, workshops services etc.) may be identified by the Participants or their representatives after consultation with the STAC.. These above mentioned contributions and their funding will be recorded by the Project Office and will serve as a record of contributions during the CTA-PCP.

**7.**

**Duration**

This Declaration of Intent will become effective for each Participant upon signature. It will end after the completion of the CTA-PCP, which is expected by the end of 2013. It can be extended by mutual consent of the Participants.

Any Participant may withdraw from this Declaration of Intent by giving three (3) months written notice to the CTA-RB.

**8.**

**New Participants**

This Declaration of Intent is open for accession of further Participants, upon unanimous agreement by the CTA-RB.

**9.**

**Disputes**

The Participants will do their utmost to settle amicably any differences of opinion and disputes, which may arise out of this Declaration of Intent or the co-operation itself. Participants shall have no recourse to the courts nor arbitration nor any third party jurisdiction.

**10.**

**Changes, Language**

(1) Changes of this Declaration of Intent require agreement in writing by all Participants.

(2) This Declaration of Intent is written in English language only. There are as many signed copies as there are Participants.

## **Annex – Description of the CTA Pre-Construction Phase**

### **1 - Goal of the CTA-PCP**

The PCP will be mainly focused on:

- The elaboration of system functional and technical requirements and identification of system concepts to comply with the science requirements.
- Convergence on a design for all CTA components, choice of the sites for all centres.
- Comparison of the system concepts against the identified needs to determine uncertainties and risks.
- Implementation, costs, schedules, organization, construction, operations, maintenance and decommissioning of CTA, taking into account the technical and programmatic constraints identified by the CTA-RB and the STAC.
- The identification and quantification of all activities and resources necessary for the construction and operation of CTA. Specification of the individual contributions of the different partners.
- The assessment of technical and programmatic risks.
- Identification of critical technologies and pre-construction activities.

### **2 - Deliverables**

The following documents shall be prepared during the Pre-Construction Phase of CTA:

- Scientific objectives, scientific requirements, flow-down from scientific requirements to technical requirements, etc.
- Technical design Report.
- Time schedule for the construction, commissioning, operation and de-commissioning.
- Selection of the CTA Observatory sites.
- Estimate, including appropriate margins, of the cost and the cost breakdown of the design, construction, commissioning, operation and de-commissioning of CTA.
- Possible funding scenario of CTA including the estimated spending profile and the allocation of funding (cash and in-kind contributions) for the construction and operation phase and terms under which the contributors shall participate.
- Proposal concerning the organizational structure for the construction and operation of CTA including data policy and long-term use.
- Draft agreement on partnership for construction and operation of CTA.

### **3 - Reviews**

Three external reviews shall be held during the CTA-PCP to evaluate the readiness of the project and to enable key decisions to be taken:

- A Science Performance and Preliminary Requirement Review (SPPRR) with the following objectives:

- Release of the primary high-level science goals of CTA.
- Release of the scientific requirements.
- Release of the technical requirements specification.
- Release of preliminary management, engineering and product assurance plans.



- Confirmation of the technical and programmatic feasibility of the system concepts.
  - Selection of system and operations concepts and technical solutions, including model and prototype philosophy and verification approach, to be carried forward to the construction phase of CTA.
  - Approval of the site selection process.
- A Preliminary Design Review (PDR) with the following objectives:
- Approval of science requirements and resulting project and system requirements
  - Verification of the preliminary design of the selected concept and technical solutions against project and system requirements.
  - Approval of technical requirements specifications.
  - Approval of product and work breakdown structures and specification tree.
  - Approval of management, engineering and product assurance plans.
  - Approval of the verification plan and prototyping philosophy.
  - Approval of the selection of the CTA Observatory sites.
  - Approval of the preliminary cost estimate including margins and uncertainties.
  - Funding scenarios for the CTA construction.
  - Assessment of programmatic aspects in CTA operation.
- A Critical Design Review (CDR) with the following objectives:
- Assessment of the qualification and validation status of the critical processes and their readiness for the construction phase
  - Confirmation of the compatibility with external interfaces
  - Approval of the final technical design.
  - Approval of assembly, integration and test planning.
  - Approval of processes for hardware/software manufacturing, assembly and testing.
  - Approval of the data-access model.
  - Validation of the final cost estimate including margins and uncertainties.
  - Validation of the funding scenario for the CTA construction and operation.

The SPPRR is foreseen in 2012, and the PDR in 2013 and the CDR in 2014. Additional reviews may be requested and arranged by the RB and/or the STAC as appropriate to monitor progress on specific aspects of CTA. The outcome of the CDR will be used to evaluate the readiness of the project to move into the construction phase of CTA.

## **Rules of Procedure and Terms of Reference for the CTA Resource Board (CTA-RB)**

### **Article 1: POSITION AND FUNCTION OF THE CTA-RB**

- 1.1 The CTA-RB is the body to exercise especially financial and organizational oversight over CTA during the CTA Pre-Construction Phase. The CTA-RB consists of the participants signing the Declaration of Intent (DoI Participants).
- 1.2 The CTA-RB approves all important issues of CTA policy, especially the ones mentioned in Article 8, and provides oversight and advice to the CTA Management.

### **Article 2: MEMBERS OF THE CTA-RB**

- 2.1 The DoI Participants may be represented in the CTA-RB by up to two delegates per country. The representatives of the DoI Participants must be nominated by a formal letter to the Chairperson and to the CTA-RB Secretariat.
- 2.2 Any change of appointment of its delegates to the RB is to be indicated in writing without undue delay.
- 2.3 The CTA Management are ex officio members of the CTA-RB without voting rights.

### **Article 3: CHAIRPERSON OF THE RB**

- 3.1 The CTA-RB shall elect a Chairperson and a Deputy Chairperson from the delegates of the DoI Participants. The Chairperson and Deputy Chairperson shall be appointed by consensus. Chairperson and Deputy Chairperson become *supra partes* and leave their delegations. The Participants affected by these departures appoint replacement representatives for the CTA-RB.
- 3.2 The CTA Management shall provide the CTA-RB Secretariat for the Chairperson. The Secretariat shall draft the minutes. The minutes shall give a record of the discussion and include all decisions taken by the CTA-RB at the meeting.

### **Article 4: CONDUCT OF BUSINESS**

- 4.1 In addition to exercising the powers conferred upon him/her elsewhere by these Rules, the Chairperson shall declare the opening and closing of each meeting, shall direct the discussion, ensure observance of these Rules, accord or withdraw the right to speak, put questions to the vote and announce decisions. The Chairperson, subject to these Rules, shall have control of the proceedings of the CTA-RB at its meetings and over the maintenance of order thereat. He/she shall rule on points of order and shall, in particular, have the power to propose adjournment or closure of the debate, or adjournment or suspension of the meeting.
- 4.2 If the Chairperson finds it necessary to be absent during a meeting, or any part thereof, the Deputy Chairperson shall take the chair. A Deputy Chairperson acting as Chairperson shall have the same powers and duties as the Chairperson.
- 4.3 The Chairperson, in the exercise of his/her functions, remains under the authority of the CTA-RB.

**Article 5: FREQUENCY AND CONVENING OF MEETINGS**

- 5.1 The CTA-RB shall meet usually twice per year.
- 5.2 Meetings of the CTA-RB shall be convened by the Chairperson. Upon request of at least two DoI Signatories the Chair shall convene extraordinary meetings.
- 5.3 Meetings of the CTA-RB shall be convened by an invitation to all its members. The invitation shall name place, day and time of the meeting and shall be sent with at least three weeks notice; in case of emergency an extraordinary meeting may be called with a shorter notice period.
- 5.4 Meetings of the CTA-RB shall not be public. Unless the CTA-RB decides otherwise, the chairpersons of the advisory committees (SSC, STAC and AFAC) and other participants may attend meetings without the right to vote but with the right to take the floor.

**Article 6: AGENDA**

- 6.1 The Chairperson prepares a draft agenda in consultation with the Spokespersons of the CTA Consortium.
- 6.2 The invitation for a meeting of the CTA-RB shall indicate the draft agenda and identify the topics of proposed resolutions and contain documentation relevant for the discussion and the resolutions. Papers to be considered by the CTA-RB must be circulated at least 15 days before the date of the meeting.
- 6.3 In the case of an extraordinary meeting a detailed description of the business to be discussed shall be circulated with the notice convening the meeting.

**Article 7: QUORUM**

The meeting of the CTA-RB shall have a quorum if two thirds of the DoI Participants are represented.

**Article 8: POWERS OF THE CTA-RB**

The CTA-RB shall aim in all cases for decisions by consensus. If consensus cannot be reached, the subject should be dealt with in the next meeting once again. In the meantime, the chair shall take measures to find a solution.

The CTA-RB decides especially on the following issues:

- Admission of new parties signing the DoI
- Amendments of the DoI
- Legal Structure of the CTA Observatory
- Sites of the Observatory
- Financial Rules of the Construction and Operation Phase
- Arrangements for long-term use and operation of the CTA Observatory
- Intellectual Property Rights
- Election of its Chairperson and Deputy Chairperson
- Establishment of committees and their terms of reference
- Rules of Procedure of the RB and its Advisory Committees
- Instructions to the CTA Management



**Article 9: VOTING PROCEDURE**

- 9.1 Each signatory of the DoI shall have one vote in the CTA-RB. Representatives of the same country are obliged to have one joint vote.
- 9.2 For written procedure and voting via email, the voting is only valid if no signatory immediately (in three days time) objects. The Chairperson shall immediately inform the RB members of the result in writing, and shall report to the next RB meeting.

**Article 10: MEETINGS**

- 10.1. Within four (4) weeks after the meeting, the chairperson, with the help from the secretariat, shall send the draft minutes to all CTA-RB Members.
- 10.2 The minutes shall be approved at the next meeting. Any proposed amendments of substance shall be circulated in writing before the meeting. The approved minutes shall be sent to the CTA-RB members within 10 days.

**Article 11: LANGUAGE**

The working language of the CTA-RB shall be English.

**Article 12: AMENDMENT TO THE RULES OF PROCEDURES of the CTA-RB and its Advisory Committees**

The present Rules can be amended by consensus of the CTA-RB members

**Article 13: ENTRY INTO FORCE**

These Rules of Procedure of the CTA-RB enter into force on *DD/MM/2012*.

**For the Argentine Republic:**

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represented by

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\_\_\_\_\_  
Signature

Heidelberg, 18 July 2012  
Place and Date

Die Kopie stimmt  
mit dem Original überein.



14. JAN. 2013

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*Wien, 20/11/2012*  
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Place and Date

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mit dem Original überein.



14. JAN. 2013

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Place and Date

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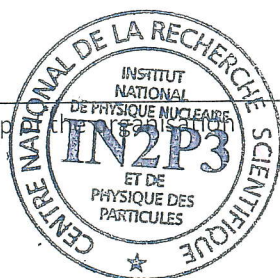
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Place and Date

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Die Kopie stimmt  
mit dem Original überein.



14. JAN. 2013

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Place and Date

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mit dem Original überein.



14. JAN. 2013

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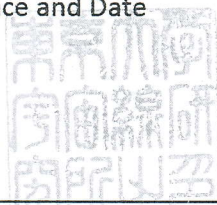
Prof. Takaaki Kajita  
Director of the Institute for Cosmic Ray Research



Signature

Kashiwa, Japan, Aug. 8, 2012

Place and Date



Stamp of the organisation

K O P Y

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Signature



Place and Date

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14. JAN. 2013

s. A. Kuske  
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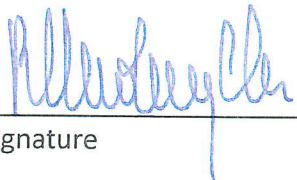


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Warsaw, 31.10.2012  
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14. JAN. 2013

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18 July 2012

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14. JAN. 2013

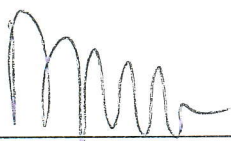
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Madrid, 25 July 2012

Place and Date



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14. JAN. 2013

*S. A. Kusch*  
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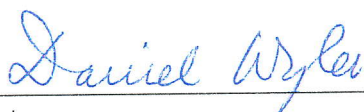


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27. Aug. 2012

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14. JAN. 2013

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