

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

PREAMBLE

The Signatories

DESIRING:

To further strengthen Europe's position in Gravitational Waves research in the world, and to intensify scientific cooperation across disciplinary and national boundaries.

CONSIDERING THAT:

- (a) With the discovery of gravitational waves (hereinafter referred to as "GW") in 2015, the field of research regarding GWs has entered a completely new domain. Whereas GW research will continue with the present infrastructures (EGO/Virgo and LIGO), it has become urgent to cooperate and start the preparations for the establishment of the third generation GW interferometer Einstein Telescope (hereinafter referred to as "ET").
- (b) ET is a project recognized by the IUPAP Gravitational Wave International Committee (GWIC) as a pillar in the next generation of ground-based gravitational wave observatories.
- (c) ET is of the highest priority in the European Strategy for Astroparticle Physics 2017-2026 of the Astroparticle Physics European Consortium (APPEC).
- (d) There is wide interest in ET as a key facility in multi messenger science.
- (e) The Signatories concerned have the vision to be active players in the preparations of ET.
- (f) The Signatories realise the expected costs (investments and operations) exceed, by far, the capabilities of European funding agencies within their standard budgets, and that strong and long term collaboration at European level is mandatory to accomplish this challenging but truly fascinating endeavor.

BUILDING ON:

- (a) The proven expertise, experience and performance of current second generation GW Infrastructures EGO/Virgo and LIGO/LSC and GEO.
- (b) The EU FP7 Conceptual Design Study (GA 2111743).

HEREBY HAVE COME TO THE FOLLOWING UNDERSTANDING:

1. Purpose of this Letter of Intent

- 1.1. The Signatories wish to express their intention to work towards the development of a programme of work for the first (pre-construction) phase of ET.
- 1.2. The Signatories intend to collaborate in agreement with their common ambition for European leadership in Third Generation Gravitational Waves Detection.
- 1.3. The Signatories will carry out their best efforts and strive for coordination and collective views.

2. Activities

To this end the Signatories shall actively stimulate the execution of a variety of activities:

- a. Preparation of an ET-application for the 2021 update of the ESFRI roadmap.
- b. Development of the science case for ET.
- c. Preparation of the full technical design of ET.
- d. Preparation of a proposal for a joint R&D programme for ET.

- e. Exploration of the computing needs and data access and handling of ET.
- f. Exploration of the societal and economic impact of ET.
- g. Preparation of a proposal for the site selection criteria.
- h. Preparation of a proposal for a site selection procedure.
- i. Preparation of a plan for outreach and engagement activities.
- j. Monitoring of the Key Performance Indicators to be identified in the ESFRI application.
- k. Preparation of a proposal for cost and funding schemes including risk analyses.
- l. Development of a strategy for acquiring the (pre-)construction costs and the operational costs.
- m. Participation with representatives of the national Research Ministries involved in the process of discussing and developing an adequate governance and management structure for ET, that will be in place before the start of ET construction.
- n. Liaise with funding agencies globally towards potential international participation in ET and coordination of 3rd generation GW detection.

3. Signatories

- 3.1. The Signatories are legal entities, i.e. Research Funding Organisations (RFOs) and Research Performing Organisations (RPOs), which support the aims of this Letter of Intent. To support these aims they should, in principle, have the funding capability to contribute to the development of ET in the pre-construction phase.
- 3.2. This Letter of Intent is open for other interested parties to sign with the agreement of all members of the Founding Board.
- 3.3. The founding Signatories are listed in Annex 1.
- 3.4. This Letter of Intent concerns the anticipated participation of the Signatories in the Founding Board and does not commit to any participation beyond this Founding Board.

4. Founding Board

- 4.1. The Signatories intend to establish a Founding Board whose membership will comprise one representative from each Signatory.
- 4.2. The Founding Board will seek to make decisions by means of sufficient consensus. In case consensus cannot be reached, said decisions shall require a two-third majority vote of all the available members of the Board.
- 4.3. The rules for nomination of the chair and the provision of secretarial services will be decided by the Founding Board.
- 4.4. The Founding Board will terminate its activities and be discharged upon the installation of a formalised (interim) governance structure for ET.
- 4.5. For the realisation of ET a more detailed description of ET and of the cooperation among the Signatories' institutions have to be defined in a future MoU or equivalent document.

5. Miscellaneous

- 5.1. The Founding Board will utilize their best endeavours to settle disputes in an amicable manner.
- 5.2. Amendments to this Letter of Intent can be agreed upon in writing by all the Signatories.
- 5.3. The present Letter of Intent does not imply any legal or financial commitment on the part of the Signatories.

SIGNATURES

Signatories declare that they approve this Letter of Intent on supporting the preparations toward the establishment of 'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory' and have caused this Letter of Intent to be duly signed by the undersigned authorised representatives.

Letter of Intent

*On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'*

Authorised to sign on behalf of

STICHTING NEDERLANDSE WETENSCHAPPELIJK ONDERZOEK INSTITUTEN

Date: February 17th 2020



.....
Prof. Dr. Stan Bentvelsen
Director NWO Institute Nikhef

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

L'ISTITUTO NAZIONALE DI FISICA NUCLEARE

20 FEB. 2020

Date:



ISTITUTO NAZIONALE DI FISICA NUCLEARE

IL PRESIDENTE

A handwritten signature in blue ink, which appears to read "Prof. Antonio Zoccoli", is written over a horizontal dotted line.

Prof. Dr. Antonio Zoccoli
President

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

Carlo Doglioni
Carlo Doglioni



Date: 2020, March 06th

IL PRESIDENTE
(Prof. Carlo DOGLIONI)
Prof. Carlo Doglioni
INGV President



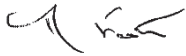
Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

The University Court of the University of Glasgow

Date: ...10 March 2020.....



.....
Name Diane Foster

Title/Function Contracts Manager



UNIVERSITAT DE
BARCELONA

Vicerektorat de Recerca

Gran Via
de les Corts Catalanes, 585
08007 Barcelona

Tel. +34 934 035 512
vr.recerca@ub.edu
www.ub.edu

Letter of Intent

*On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'*

Authorised to sign on behalf of

Date: Barcelona, March 10, 2020

Domènec Espriu
Vice-Rector for Research
Barcelona University



UNIVERSITAT DE
BARCELONA
Vicerektorat de Recerca


Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

RWTH Aachen University

Date: 11/3/2020.....


.....
Univ.-Prof. Dr. rer. nat. Dr. h. c. mult. Ulrich Rüdiger
Rektor

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

Institut de Física d'Altes Energies (IFAE)

Date: Barcelona, March 11, 2020



Ramón Miquel
Director of IFAE
Barcelona, Spain



Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

Institute of Space Sciences

Date: March 12, 2020

Diego F. Torres
Director

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

UNIVERSITY OF PORTSMOUTH

Date: MARCH 13TH 2020



.....
Prof. Bob Nichol

Pro Vice-Chancellor (Research and Innovation)

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of the

Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V.,

acting through the Max-Planck-Institut für Gravitationsphysik,

Albert Einstein Institute (AEI),

a private public body organised under the laws of Germany,

and having its registered office Hofgartenstrasse 8 – 80539 München (Germany),

represented by Prof. Dr. Alessandra Buonanno, Managing Director

Date:

.....

Prof. Dr. Alessandra Buonanno
Managing Director AEI

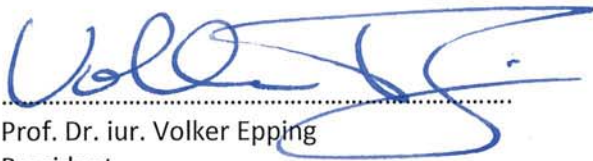
Letter of Intent

*On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'*

Authorised to sign on behalf of

Gottfried Wilhelm Leibniz Universität Hannover

Date: 16. März 2020



A handwritten signature in blue ink, appearing to read 'Volker Epping', written over a dotted line.

Prof. Dr. iur. Volker Epping
President

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

MAASTRICHT UNIVERSITY

Date: 17 March 2020




.....
Prof. Dr. M. Paul
Président

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of The University of Birmingham

Date: 20/03/2020


.....
Name: AMELIA PEITCH

Title/Function: HEAD OF RESEARCH CONTRACTS

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

Faculty of Mathematics, Informatics and Natural Science, Universität Hamburg

Date: 23.03.2020



.....
Prof. Dr. Heinrich Graener
Dean of the Faculty

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

CARDIFF UNIVERSITY

Date: ..24th March 2020.....

..Dr. Elid Morris, Head of Research Grants.....

Name

Title/Function

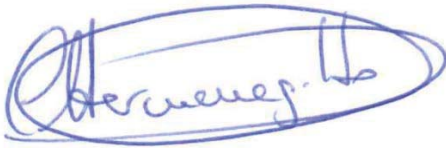
Letter of Intent

*On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'*

Authorised to sign on behalf of

UNIVERSITAT DE VALÈNCIA

Date: March 24th, 2020



.....
Carlos Hermenegildo
Vice-Principal for Research

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

UNIVERSITAT DE LES ILLES BALEARS

Date:25.03.2020.....



The stamp consists of a blue diamond-shaped logo on the left containing the letters 'UIB'. To the right of the logo, the text 'Universitat de les Illes Balears' is printed in a blue, sans-serif font. The entire stamp is enclosed in a thin blue rectangular border.

GARCIA RIAZA Firmado digitalmente
por GARCIA RIAZA
ENRIQUE - DNI ENRIQUE - DNI
06561719A 06561719A
Fecha: 2020.03.25
09:51:54 +01'00'

.....
Prof. Enrique García Ríaza
Vicerrector de Investigación e Internacionalización
Universitat de les Illes Balears

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

[NAME Signatory]

Date:March 26 th.....2020.....



.....
Maria Del Zompo
Rector
Legal Representative
Università degli Studi di Cagliari, Italia/ University of Cagliari , Italy

Letter of Intent
On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

Instituto de Estructura de la Materia, Agencia Estatal Consejo Superior de Investigaciones Científicas

Date:27 March 2020.....

.....Guillermo Antonio Mena Marugán, Director

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC)

Date: Madrid, March 27th, 2020

Signed:

Elena Domínguez Cañas
Vice-President for International Affairs

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

ISTITUTO NAZIONALE DI ASTROFISICA

Date: March 30, 2020



.....
Prof. Nicolò D'Amico
President

Letter of Intent

*On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'*

Authorised to sign on behalf of

Université de Genève

3/30/2020

Date:

DocuSigned by:
Brigitte Galliot
04D8C9CA70504FC...

.....
Prof. Brigitte Galliot
Vice-Rector

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

VRIJE UNIVERSITEIT BRUSSEL

Pleinlaan 2, B-1050 Brussels, Belgium

Date: March 31, 2020

A handwritten signature in blue ink, consisting of a long horizontal stroke with a small loop at the end and a vertical stroke on the left side.

Professor Caroline PAUWELS
Rector of the Vrije Universiteit Brussel

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

UNIVERSITY OF STRATHCLYDE

Date:31st March 2020.....



.....
Name Alison McFarlane

Title/Function Director, Research & Knowledge Exchange Services

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

University of Warsaw

Date: April 2nd 2020

.....

Professor Maciej Duszczyk

Vice-Rector for Research and International Relations



**INSTITUTE OF MATHEMATICS
OF THE POLISH ACADEMY OF SCIENCES**

Sniadeckich 8, 00-656 Warsaw, Poland, www.impan.pl, e-mail: im@impan.pl
tel. +48 225228100, fax: +48 226293997

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

Institute of Mathematics of the Polish Academy of Sciences

Date: 2.04.2020

Prof. Łukasz Stettner
Director of the Institute

Letter of Intent

On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'

Authorised to sign on behalf of

**Nicolaus Copernicus Astronomical Centre of the Polish Academy of Sciences
(CAMK PAN)**

Date: **7.04.2020**

.....
Piotr Życki, Director of CAMK PAN

Letter of Intent

*On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'*

Authorised to sign on behalf of

Università degli Studi di Sassari



Il Rettore dell'Università degli Studi di Sassari
Prof. Massimo Carpinelli

Date: 04/23/2020

Prof. Dr. Massimo Carpinelli
Rector, University of Sassari

Letter of Intent

*On supporting the preparations toward the establishment of
'Einstein Telescope (ET): 3rd Generation Gravitational Wave Observatory'*

Authorised to sign on behalf of Fonds Wetenschappelijk onderzoek (FWO)

Dr. Hans Willems
Prof. Em. Willy Verstraete

Date:

FWO signs the aforementioned letter of Intent but only to the extent that the following phrase of article 3.1 „*To support these aims they should, in principle, have the funding capability to contribute to the development of ET in the pre-construction phase*“ cannot impose any real or specific financial claims towards FWO without further negotiations between the parties.

Hans
Willems

Digitally signed by Hans Willems
DN: cn=Hans Willems, o=FWO,
ou=secretaris-generaal,
email=hans.willems@fwo.be,
c=BE
Date: 2020.06.01 10:29:59 +02'00'

Dr. Hans Willems

Secretary general



Prof. Em. Willy Verstraete

Chairman

ANNEX 1 List of Signatories – status 28 February 2020 (will be updated until 3 April 2020)

Founding Signatories

STICHTING NEDERLANDSE WETENSCHAPPELIJK ONDERZOEK INTITUTEN, established in Winthontlaan 2, 3526 KV Utrecht, The Netherlands, represented by Professor Stan BENTVELSEN, Director of the NWO Institute Nikhef

L'ISTITUTO NAZIONALE DI FISICA NUCLEARE, established in Piazza dei Caprettari, 70, Roma 00186, Italy, represented by Professor Antonio ZOCCOLI, president of INFN

In process:

DEUTSCHES ELEKTRONEN-SYNCHROTRON DESY, established in Notkestraße 85, 22607 Hamburg, Germany, represented by the Board of Directors

SCIENCE AND TECHNOLOGY FACILITIES COUNCIL AS PART OF THE UNITED KINGDOM RESEARCH AND INNOVATION, established in Polaris House, North Star Avenue, Swindon SN2 1SZ, United Kingdom, represented by [NAME]

Add more Founding Signatories

Signatories

Add here Signatories that join and sign later