

HORIZON  
2020

# An innovative Cylindrical Gas Electron Multiplier Inner Tracker for the BESIII Spectrometer

## Fact Sheet

### Project Information

#### BESIIICGEM

Grant agreement ID: 645664

[Project website](#) 

#### DOI

[10.3030/645664](https://doi.org/10.3030/645664) 

Project closed

#### EC signature date

7 November 2014

#### Start date

1 January 2015

#### End date

31 December 2018

#### Funded under

EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

#### Total cost

€ 1 498 500,00

#### EU contribution

€ 1 498 500,00

#### Coordinated by

ISTITUTO NAZIONALE DI FISICA  
NUCLEARE



## Objective

Inner Trackers (IT) are key detectors in Particle Physics experiments; excellent spatial resolution, radiation transparency and hardness, and operability under high occupancies are main requirements. While planar Gas Electron Multiplier (GEM) detectors are common in modern spectrometers, only one Cylindrical-GEMs (CGEM) detector has been produced up to now by the KLOE2 Collaboration and is being commissioned.

We aim to design, build and commission by 2017 a CGEM detector candidate to be the new IT of the BESIII spectrometer, hosted on BEPC2 in IHEP, Beijing; BESIII data taking will last until at least 2020. The IT itself will represent an evolution w.r.t. the state of the art of GEM (and CGEM) detectors, since the use of new kind of supports for the GEM foils will reduce the total radiation length of the detector and improve its tracking performance; an innovative design of the CGEM anode will allow for smaller capacitance and hence for bigger signals.

The relatively strong BESIII magnetic field requires a new analogue readout; full custom front-end electronics, including a dedicated ASIC, will be designed and produced for optimal data collection.

Specific software will be developed to first simulate, and then reconstruct the CGEM hits to detect reaction products.

Proper benchmark channels will be identified and investigated to maximise the outcome of the project.

An existing cloud infrastructure hosting a virtualised grid Tier-2 will be further expanded, providing an advanced environment optimised for scientific computing, suitable to investigate specific tools beyond commercial standards as well.

The project could significantly enhance the already established interaction between the participating EU and Chinese Institutions in BESIII, strengthening in particular those technological aspects remained so far in the background of the cooperation, and providing clear deliverables as the CGEM IT, the secondments being the key to knowledge transfer within the network.

## Fields of science (EuroSciVoc)

[natural sciences](#) > [computer and information sciences](#) > **[software](#)**

[natural sciences](#) > [physical sciences](#) > [theoretical physics](#) > [particle physics](#) > **[particle accelerator](#)**

[natural sciences](#) > [physical sciences](#) > **[nuclear physics](#)**

[natural sciences](#) > [computer and information sciences](#) > **[computational science](#)**

[social sciences](#) > [political sciences](#) > **[government systems](#)**



## Programme(s)

[H2020-EU.1.3. - EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions](#)

MAIN PROGRAMME

[H2020-EU.1.3.3. - Stimulating innovation by means of cross-fertilisation of knowledge](#)

## Topic(s)

## Call for proposal

[H2020-MSCA-RISE-2014](#) 

[See other projects for this call](#)

## Funding Scheme

[MSCA-RISE - Marie Skłodowska-Curie Research and Innovation Staff Exchange \(RISE\).](#)

## Coordinator



**ISTITUTO NAZIONALE DI FISICA NUCLEARE**

Net EU contribution

**€ 657 000,00**

Total cost

**€ 657 000,00**

Address

**Via Enrico Fermi 54**

**00044 Frascati**

 **Italy** 

Region

**Centro (IT) > Lazio > Roma**

Activity type

**Research Organisations**

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

## Participants (2)



## JOHANNES GUTENBERG-UNIVERSITÄT MAINZ

 Germany

Net EU contribution

**€ 670 500,00**

Address

**SAARSTRASSE 21**

**55122 Mainz** 

Region

**Rheinland-Pfalz > Rheinhessen-Pfalz > Mainz, Kreisfreie Stadt**

Activity type

**Higher or Secondary Education Establishments**

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

**€ 670 500,00**



## UPPSALA UNIVERSITET

 Sweden

Net EU contribution

**€ 171 000,00**

Address

**VON KRAEMERS ALLE 4**

**751 05 Uppsala** 

Region

**Östra Sverige > Östra Mellansverige > Uppsala län**

Activity type

**Higher or Secondary Education Establishments**

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

**€ 171 000,00**

# Partners (1)

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PARTNER 

**INSTITUTE OF HIGH ENERGY PHYSICS CHINESE ACADEMY OF SCIENCES**



China

Net EU contribution

**€ 0,00**

Address

**YUQUAN ROAD 19B**

**100049 BEIJING** 

Activity type

**Research Organisations**

Links

[Contact the organisation](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

**No data**

**Last update:** 15 August 2022

**Permalink:** <https://cordis.europa.eu/project/id/645664>

European Union, 2025