

# Construction MoU of CBM Collaboration

8<sup>th</sup> CBM Resource Review Board meeting  
26<sup>th</sup> November 2018

Report  
CBM Resource Coordinator  
Jürgen Eschke

# Overview

- Purpose of Construction MoU (CMoU)
- CERN model
- Content CMoU
- Common Fund
- Next steps

# Construction MoU of CBM Collaboration

Purpose of Construction MoU (for construction phase):

## 1. inside the collaboration

Collaboration agrees on responsibility for construction work packages

CMoU defines:

- a) In-Kind contributions of member institutions (hardware),  
but also substantial manpower contributions of member institutions  
→ only these CBM member institutions are eligible to sign CMoU  
(others downgraded to associated members)
  
- b) Organizational, managerial and financial rules of collaboration

# Construction MoU of CBM Collaboration

Purpose of Construction MoU (for construction phase):

## 2. to the outside

### a) FAIR GmbH as Host Laboratory

FAIR needs to be confident about:

- solidity of collaboration's construction plans and capacity
- funding of experiment construction

Relation: Host Lab  $\leftrightarrow$  Collaboration (rights and duties)

### b) Funding Agencies

Funding Agencies need to be confident about:

- solidity of collaboration's construction plans and capacity
- financial contributions of other funding agencies

Operation phase will be regulated by an additional document (Addendum to MoU)

# CERN model

(we do not reinvent the wheel)



**LHC Resources Review Boards (LHC-RRB)**

The Resources Review Board (RRB) comprises the representatives of each Experiment's Funding Agencies and the managements of CERN and of each Experiment's Collaboration. It is chaired by the CERN Director for Research and Computing.

The role of the RRB includes :

- reaching agreement on the Memorandum of Understanding
- monitoring the Common Projects and the use of the Common Funds
- monitoring the general financial and manpower support
- reaching agreement on a maintenance and operation procedure and monitoring its functioning
- endorsing the annual construction and maintenance and operation budgets of the detector.

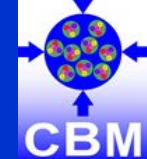
The management of the Collaboration reports regularly to the RRB on technical, managerial, financial and administrative matters, and on the composition of the Collaboration.

**Chairperson:** CERN Director for Research and Computing

- CERN has implemented the RRB process for the LHC experiments
- LHC collaborations have concluded MoUs for construction and operation phase
- Most of funding agencies participate at the CERN RRBs since many years and have signed MoUs for the LHC experiments

→ we profit from this successful model

# CBM organisation



## Collaboration Board

Chair N. Xu (CCNU), Dep. A. Kugler (NPI-CAS)

## Spokesperson

N. Herrmann (UHD), Dep. S. Chattopadhyay (VECC) . V. Ladygin (JINR)

## Management Board

### Resource Board

J. Eschke (FAIR)

- China  
N. Xu (CCNU)
- Czech Rep.  
A. Kugler (NPI-CAS)
- Germany  
K. Kampert (UWU)
- Hungary  
G. Wolf (WRCP)
- India  
S. Chattopadhyay (VECC)
- Korea  
I.-K. Yoo (PNU)
- Poland  
P. Staszcz (UJAG)
- Romania  
M. Petrovici (IFIN-HH)
- Russia  
A. Akidimov (ITEP)
- Ukraine  
V. Putgatch (KINR)

### Technical Board

W.F.J. Müller (FAIR)

- Cave M. Kis (GSI)
- Magnet P. Senger (GSI)
- MVD J. Stroth (UFRA, GSI)
- STS H.R. Schmidt (UTÜB, GSI)
- MUCH S. Chattopadhyay (VECC)
- RICH C. Höhne (UGI),  
K. Kampert (UWU)  
C. Blume (UFRA)
- TRD I. Deppner (UHD)
- TOF I. Korolko (ITEP)
- ECAL I. Korolko (ITEP)
- PSD F. Guber (INR)
- DAQ D. Emschermann (GSI)
- FLES-IN J. DeCuveland (FIAS)

### Computing Board

V. Friese (GSI)

- SIM V. Friese (GSI)
- EDC P.A. Loizeau (GSI)
- ODM J. DeCuveland (FIAS)
- DPF F. Uhlig (GSI)
- ALG M. Zyzak (GSI)
- OAE NN
- INF NN

### Physics Board

I. Selyuzhenkov (GSI)

- Hadron I. Vassiliev (GSI)
- Dilepton T. Galatyuk (TUD)
- C2F I. Selyuzhenkov (GSI)
- Charm (M. Deveaux (UFRA))

### Conference & Editorial Board

H.R. Schmidt (UTÜB, GSI)

### Acronyms

MVD – Micro Vertex Detector  
 STS – Silicon Tracking System  
 MUCH – MUon Chambers  
 RICH – Ring Imaging Cherenkov detector  
 TRD – Transition Radiation Detector  
 TOF – Tim Of Flight detector  
 ECAL – Electromagnetic CALorimeter  
 DAQ – Data AcQuisition system  
 FLES- IN – First Level Selector – Input Nodes

SIM - SIMulation  
 EDC – Experiment & Detector Control  
 ODM – Online Data Management  
 DPF – Data Processing Framework  
 ALG – ALgorithms  
 OAE – Offline Analysis Environment  
 INF – software INFrastructure  
 C2F – Correlation, Flow, Fluctuations

# Memorandum of Understanding for Collaboration in the Construction of the Compressed Baryonic Matter (CBM) Experiment at FAIR

between

the Facility for Antiproton and Ion Research in Europe GmbH, as the Host Laboratory

and

the institutions forming the CBM Collaboration together with the corresponding funding agencies

**Article 1 Parties to this MoU**

**Article 2 Purpose of this MoU**

**Article 3 Duration of this MoU and its Extension**

**Article 4 The CBM Experiment and Collaboration**

**Article 5 Program of Work for the Construction Phase of the CBM Experiment  
and Sharing of responsibilities for its Execution**

**Article 6 Common Projects and Common Fund**

**Article 7 Obligations of FAIR as Host Laboratory, and of the Institutes**

**Article 8 Relationship CBM Collaboration – FAIR**

**Article 9 Rights and Benefits of the Institutes**

**Article 10 Administrative and Financial Provisions**

**Article 11 Amendments**

**Article 12 Disputes**

**Article 13 Effective date**

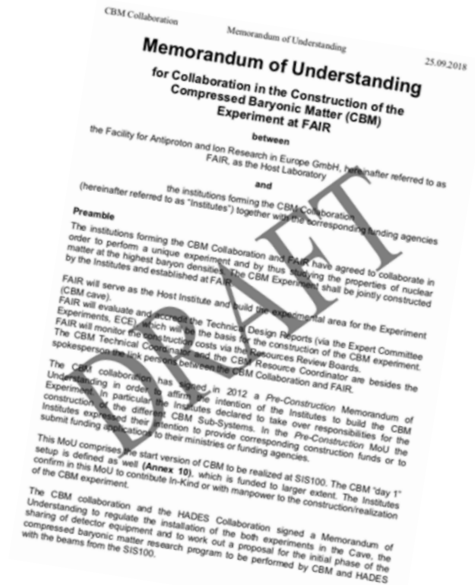
**Article 14 Annexes**

**Article 15 Final Provisions**

26.11.2018

8th CBM RRB

Jürgen Eschke, CBM RC



# ANNEXES (CBM Construction MoU)

- Annex 1:** List of Institutions (and names of the Collaboration Board members) forming the CBM Collaboration
- Annex 2;** List of Funding Agencies and their Representatives
- Annex 3a:** List of the members of the CBM Collaboration given by Country and by Institute
- Annex 3b:** Organisation rules of the CBM Collaboration, Management structure of the CBM Collaboration, Management Board members and of persons holding management positions in the CBM Collaboration
- Annex 4a:** Detailed compilation of the Construction Cost and Funding of the Detector/Subsystems, and of Responsibilities for the Construction Workpackages by the Institutes.
- Annex 4b:** Summary Tables on Construction Cost and Funding with the Values of Commitments by Funding Agency to the CBM Detectors/Subsystems.
- Annex 5:** Status of Technical Design Reports
- Annex 6:** List of substantial manpower contributions of Institutes to Subsystem Construction, to Computing Subprojects, to the Physics Working Groups and to Preparation and Coordination tasks
- Annex 7:** Construction Schedule
- Annex 8:** Procedures for the Common Construction Fund for the Cave Infrastructure
- Annex 9:** General conditions applicable to experiments at FAIR
- Annex 10:** The CBM Day 1 experimental setup



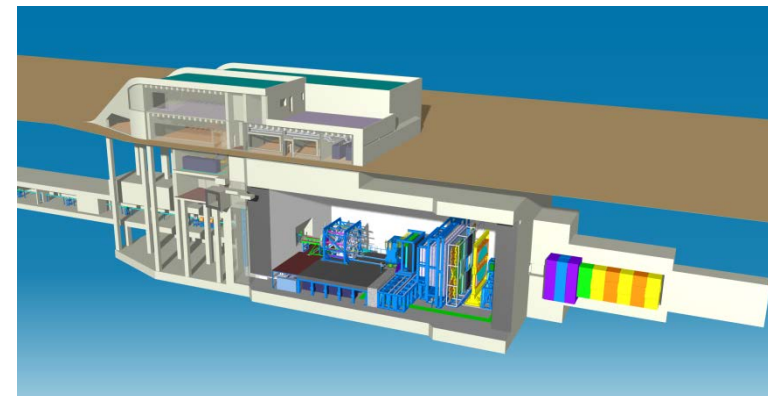
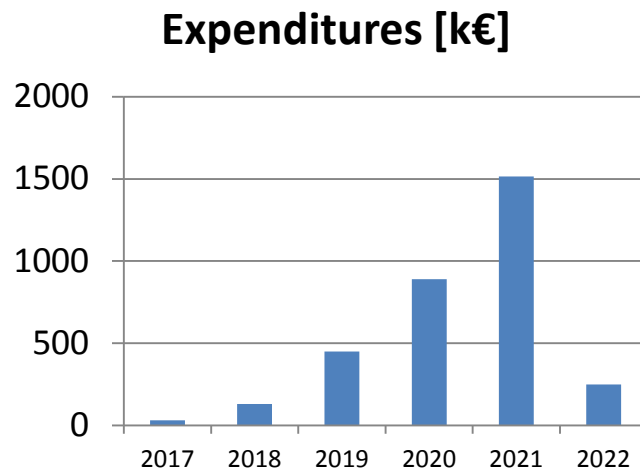
# CBM Common Fund

The cave infrastructure items are of common interest of all participating institutes in the CBM collaboration. They need to be purchased and installed in the CBM cave in order to provide a proper technical environment in the CBM cave for the mounting of all detector systems (in-kind contributions of the CBM member institutes).

## Cost estimate and expenditures [in k€ and 2018 prices] for the CBM cave infrastructure:

		no TDR foreseen	all countries involved in CBM	covered by CBM <b>Common</b>		
1.1.1.10	<b>Infrastructure</b>				all CBM member institutes	<b>3264</b>
1.1.1.10.1	Target area Beam pipe & vacuum		CBM	Common Fund	all CBM member institutes	<b>337</b>
1.1.1.10.2	Rail system		CBM	Common Fund	all CBM member institutes	<b>611</b>
1.1.1.10.3	Common data optical fibers		CBM	Common Fund	all CBM member institutes	<b>211</b>
1.1.1.10.4	Electronics Racks		CBM	Common Fund	all CBM member institutes	<b>368</b>
1.1.1.10.5	Cryogenics		CBM	Common Fund	all CBM member institutes	<b>274</b>
1.1.1.10.6	Detector gas infrastructure		CBM	Common Fund	all CBM member institutes	<b>347</b>
1.1.1.10.7	General infrastructure & safety		CBM	Common Fund	all CBM member institutes	<b>621</b>
1.1.1.10.8	Common support structures		CBM	Common Fund	all CBM member institutes	<b>284</b>
1.1.1.10.9	distribution		CBM	Common Fund	all CBM member institutes	<b>211</b>

Year	Expenditures [k€]
2017	30
2018	130
2019	450
2020	890
2021	1515
2022	249
<b>Total [k€]</b>	<b>3264</b>



# CBM Common Fund

**CBM collaboration decided to implement a Common Fund for covering the investment costs of the CBM cave infrastructure (PSP code 1.1.1.10) of about 3,3 M€ (2018 prices).**

**Decision of the CBM Collaboration Board (Sept. 2017):**

*„The CB sees the urgent need to collect the following amounts per member institute per PhD holder in the following years for covering the investment costs of the cave infrastructure:*

*2018 – 500 Euro*

*2019 – 2000 Euro*

*2020 – 3500 Euro*

*2021 – 4500 Euro*

*2022 – 500 Euro*

*The capability of the CBM member institutes to contribute with these annual payments depends on the support of the corresponding national funding agencies.*

*The CBM CB therefore urges the FAIR management to ask the funding agencies at the next RRB meeting to implement common funds for the FAIR experiments.”*

# CBM Common Fund

## Procedure for Common Fund

It is planned to cover the investment costs of the CBM cave infrastructure (PSP code 1.1.1.10) of about 3,3 M€ (2018 prices) by the Common Fund.

The CBM collaboration has decided to implement a Common Fund. **Each full member institute shall contribute according to the number of PhD holders working for CBM.** The annual due amounts per institute have been defined such that the required expenditures for the cave infrastructure are covered.

The implementation of the CBM Common Fund depends on the support of the national funding agencies from the corresponding country.

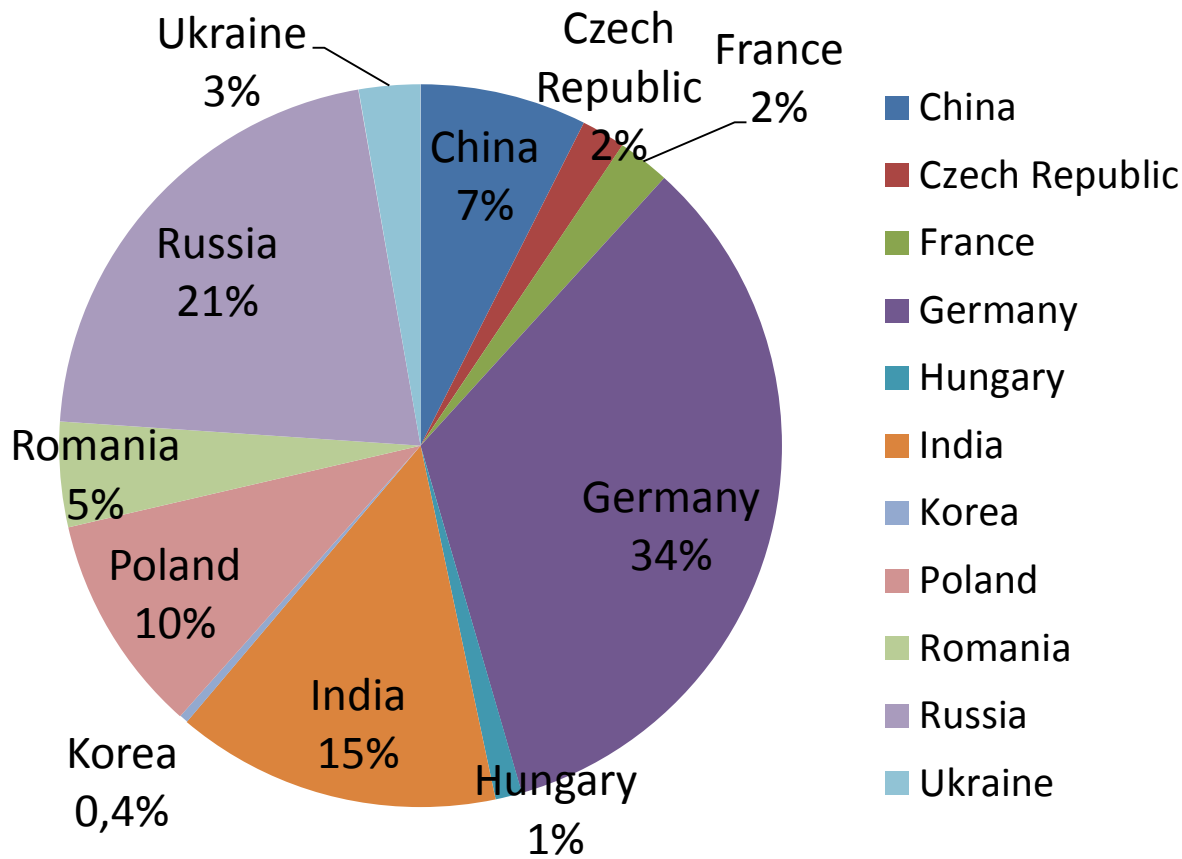
# CBM Common Fund

Institute	Country	all CBM members	PhD-Students	PhDs + Profs	common fund 2018 [€]	common fund 2019 [€]	common fund 2020 [€]	common fund 2021 [€]	common fund 2022 [€]	Total [€]	Total per country [€]	Fraction per country [%]
					500	2000	3500	4500	2300			
					EURO per PhD/Prof	EURO per PhD/Prof	EURO per PhD/Prof	EURO per PhD/Prof	EURO per PhD/Prof			
Tsinghua (THU)	China	8	3	5	2.500	10.000	17.500	22.500	11.500	64.000		
USTC	China	8	4	2	1.000	4.000	7.000	9.000	4.600	25.600		
CCNU	China	12	4	8	4.000	16.000	28.000	36.000	18.400	102.400		
Uchongqing	China	2	0	1	500	2.000	3.500	4.500	2.300	12.800		
CTGU	China	4	1	3	1.500	6.000	10.500	13.500	6.900	38.400	243.200	7,45
CTU	Czech Republic	2	0	1	500	2.000	3.500	4.500	2.300	12.800		
NPI-CAS	Czech Republic	5	1	4	2.000	8.000	14.000	18.000	9.200	51.200	64.000	1,96
IPHC	France	12	1	6	3.000	12.000	21.000	27.000	13.800	76.800	76.800	2,35
ZIB	Germany	4	0	3	1.500	6.000	10.500	13.500	6.900	38.400		
FAIR	Germany	2	0	2	1.000	4.000	7.000	9.000	4.600	25.600		
GSI	Germany	52	3	39	19.500	78.000	136.500	175.500	89.700	499.200		
IKP-TUD	Germany	3	2	1	500	2.000	3.500	4.500	2.300	12.800		
HZDR	Germany	5	1	3	1.500	6.000	10.500	13.500	6.900	38.400		
FIAS	Germany	10	5	5	2.500	10.000	17.500	22.500	11.500	64.000		
IKF-UFra	Germany	22	10	9	4.500	18.000	31.500	40.500	20.700	115.200		
IRI-UFra	Germany	9	6	3	1.500	6.000	10.500	13.500	6.900	38.400		
UGiessen	Germany	11	5	4	2.000	8.000	14.000	18.000	9.200	51.200		
PI-UHd	Germany	5	2	2	1.000	4.000	7.000	9.000	4.600	25.600		
KIT	Germany	8	0	4	2.000	8.000	14.000	18.000	9.200	51.200		
ZITI-UHd	Germany	1	0	1	500	2.000	3.500	4.500	2.300	12.800		
UMuenster	Germany	13	3	4	2.000	8.000	14.000	18.000	9.200	51.200		
UTuebingen	Germany	9	6	3	1.500	6.000	10.500	13.500	6.900	38.400		
UWuppertal	Germany	9	4	3	1.500	6.000	10.500	13.500	6.900	38.400	1.100.800	33,73
ELTE	Hungary	2	0	1	500	2.000	3.500	4.500	2.300	12.800		
WignerRCP	Hungary	4	0	2	1.000	4.000	7.000	9.000	4.600	25.600	38.400	1,18
AMU	India	6	1	5	2.500	10.000	17.500	22.500	11.500	64.000		
IOPB	India	2	0	1	500	2.000	3.500	4.500	2.300	12.800		
UPanjab	India	4	0	4	2.000	8.000	14.000	18.000	9.200	51.200		
UGauhati	India	2	1	1	500	2.000	3.500	4.500	2.300	12.800		
IIT-I	India	3	1	2	1.000	4.000	7.000	9.000	4.600	25.600		
UJammu	India	4	0	3	1.500	6.000	10.500	13.500	6.900	38.400		
IIT-KGP	India	4	2	2	1.000	4.000	7.000	9.000	4.600	25.600		
Bose	India	9	1	7	3.500	14.000	24.500	31.500	16.100	89.600		
UCalcutta	India	4	1	3	1.500	6.000	10.500	13.500	6.900	38.400		
VECC	India	11	4	5	2.500	10.000	17.500	22.500	11.500	64.000		
UKashmir	India	5	0	2	1.000	4.000	7.000	9.000	4.600	25.600		
UBanaras	India	2	0	2	1.000	4.000	7.000	9.000	4.600	25.600	473.600	14,51
PNU	Korea	1	0	1	500	2.000	3.500	4.500	2.300	12.800	12.800	0,39
AGH	Poland	14	2	12	6.000	24.000	42.000	54.000	27.600	153.600		
UJagiellonian	Poland	6	0	5	2.500	10.000	17.500	22.500	11.500	64.000		
TUWarsaw	Poland	8	3	5	2.500	10.000	17.500	22.500	11.500	64.000		
UWarsaw	Poland	3	0	3	1.500	6.000	10.500	13.500	6.900	38.400	320.000	9,80
IFIN-HH	Romania	5	0	4	2.000	8.000	14.000	18.000	9.200	51.200		
UBucharest	Romania	9	1	8	4.000	16.000	28.000	36.000	18.400	102.400	153.600	4,71
JINR-LIT	Russia	8	2	6	3.000	12.000	21.000	27.000	13.800	76.800		
JINR-VBLHEP	Russia	20	1	9	4.500	18.000	31.500	40.500	20.700	115.200		
PNPI	Russia	15	0	10	5.000	20.000	35.000	45.000	23.000	128.000		
INR	Russia	12	1	5	2.500	10.000	17.500	22.500	11.500	64.000		
ITEP	Russia	15	2	9	4.500	18.000	31.500	40.500	20.700	115.200		
MEPhI	Russia	11	2	8	4.000	16.000	28.000	36.000	18.400	102.400		
NRC-KI	Russia	5	0	3	1.500	6.000	10.500	13.500	6.900	38.400		
SINP-MSU	Russia	5	1	3	1.500	6.000	10.500	13.500	6.900	38.400		
IHEP	Russia	7	0	1	500	2.000	3.500	4.500	2.300	12.800	691.200	21,18
KINR	Ukraine	8	2	2	1.000	4.000	7.000	9.000	4.600	25.600		
UKyiv	Ukraine	6	1	5	2500	10000	17500	22500	11.500	64.000	89.600	2,75
<b>Total:</b>		<b>436</b>	<b>90</b>	<b>255</b>	<b>127.500</b>	<b>510.000</b>	<b>892.500</b>	<b>1.147.500</b>	<b>586.500</b>	<b>3.264.000</b>	<b>3.264.000</b>	<b>100,00</b>

Breakdown of the suggested annual contributions to the CBM Common Fund for the member institutes of the CBM collaboration (CBM data base 25<sup>th</sup> September 2018):

# CBM Common Fund

Breakdown of the suggested annual contributions to the CBM Common Fund for the member institutes of the CBM collaboration (CBM data base 25<sup>th</sup> September 2018):

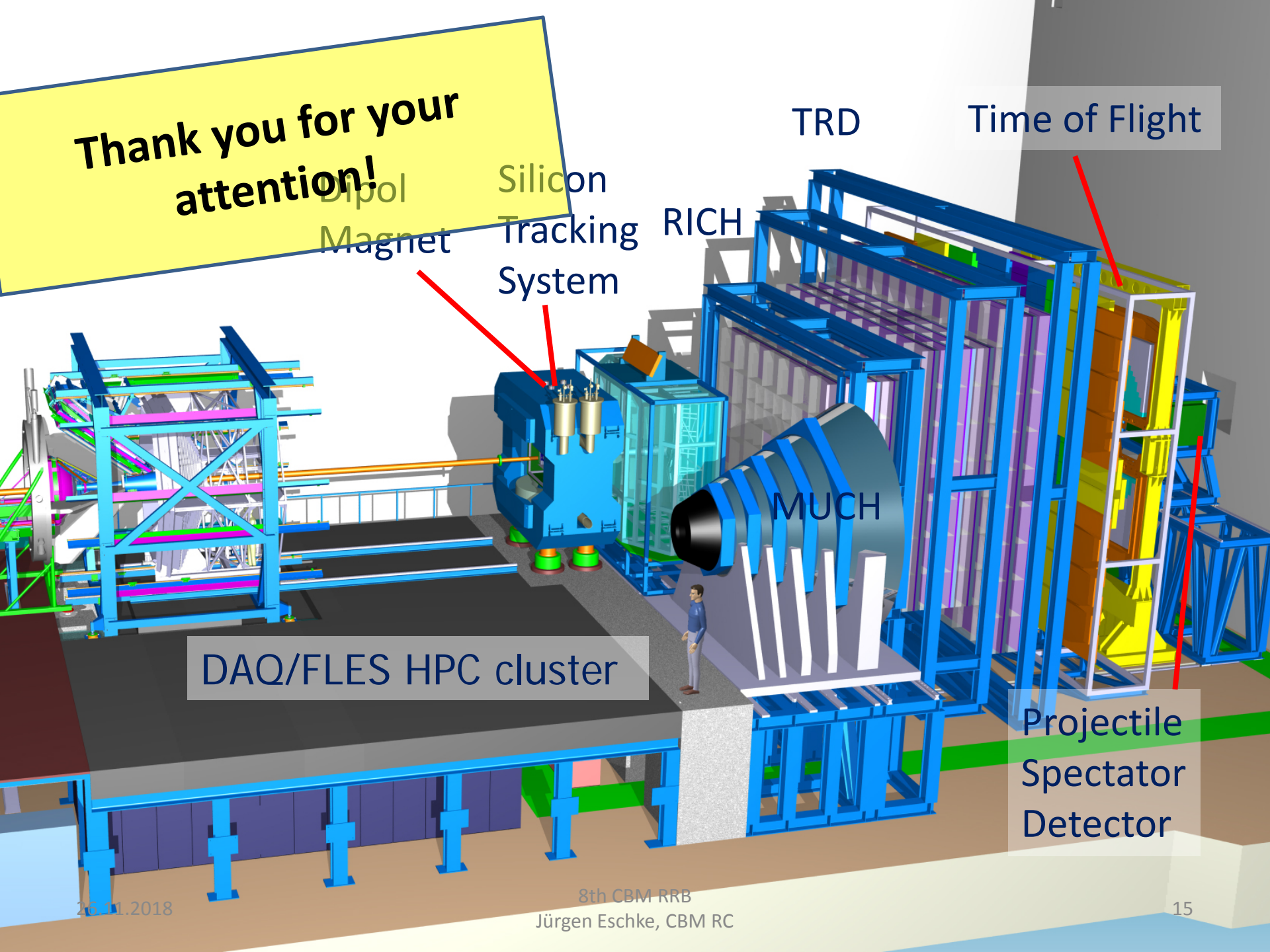


amount [k€]	country
243,2	China
64,0	Czech Republic
76,8	France
1100,8	Germany
38,4	Hungary
473,6	India
12,8	Korea
320,0	Poland
153,6	Romania
691,2	Russia
89,6	Ukraine
<b>3264</b>	

# Next Steps

- Collaboration will start to collect money for Common Fund asap
- Finalization of draft of CBM construction MoU
- Start of signing of CMoU intended for end 2019

Thank you for your attention!



Dipole Magnet

Silicon Tracking System

RICH

TRD

Time of Flight

MUCH

DAQ/FLES HPC cluster

Projectile Spectator Detector

# Backup Slides

(slides from Paolos RRB talk)



- Host lab vs experiment responsibility
  - All infrastructures, which are experiment specific, i.e. would not or be different if a different experiment would enter the cave, are to be borne by the experimental collaboration,
  - The non-experiment-specific infrastructures are provided by the host lab.
- Definition of Common Infrastructure Items decided by the individual collaboration
  - Items being in the experiment's responsibility
  - Indispensable for Day-1 operation of the experiment
  - Representing a common infrastructure for the experiment
  - Cannot be taken over by an individual institution.
- Eligible items may be proposed by Collaboration after internal agreement
- Established procedure in HEP experiments around the world

# Collaboration's Proposals

- Table shows current proposals by respective collaborations
- Common Funds to be shared according to model suited best for each community
  - CBM, PANDA and NUSTAR: equal share among all members of the respective collaboration with PhD degree eligible to appear on the authors' list
  - In case of NUSTAR sharing in sub-collaborations will be considered
  - APPA: still under discussion, very different and heterogeneous community, potential amounts very small

	PSP	Name	ECB value [2005 k€]
CBM	1.1.1.10.1	Target area Beam pipe & vacuum	235
	1.1.1.10.2	Rail system	425
	1.1.1.10.3	Common data optical fibers	147
	1.1.1.10.4	Electronics Racks	257
	1.1.1.10.5	Cryogenics	191
	1.1.1.10.6	Detector gas infrastructure	242
	1.1.1.10.7	General infrastructure & safety	433
	1.1.1.10.8	Common support structures	198
	1.1.1.10.9	Power & standard media distribution	147
	<b>CBM Subtotal</b>		<b>2,273</b>
NUSTAR	1.2.1.2.4	LEB Detectors and slit system for FLF6 for MATS/LaSpec	135.7
	1.2.1.2.5	LEB Beam line to MATS-LaSpec hall for MATS/LaSpec	154.0
	1.2.1.7	LEB Beam line to MATS RFQ for MATS/LaSpec	200.0
	1.2.2.2.1	HISPEC/DESPEC Beamline (1st share)	127.1
	1.2.2.5.1	HISPEC/DESPEC Safety (1st share)	132.1
	1.2.5.1.1.3.3	R3B Valve box GLAD	128.1
	1.2.5.1.1.3.4	R3B Infrastructure magnets (3rd sh.)	200.0
	<b>NUSTAR Subtotal</b>		<b>1,077.0</b>
PANDA	1.4.1.18.1	Supports	2,400
	1.4.1.18.2	Supplies	760
	1.4.1.18.3	Controls	400
	1.4.1.19.4	DAQ	980
	<b>PANDA Subtotal</b>		<b>4,540</b>
	<b>Total</b>		<b>7,890</b>

## Collaboration's Proposals

- Table shows current proposals by respective collaborations
- Common Funds to be shared according to model suited best for each component

	PSP	Name	ECB value [2005 k€]
CBM	1.1.1.10.1	Target area Beam pipe & vacuum	235
	1.1.1.10.2	Rail system	425
	1.1.1.10.3	Common data optical fibers	147
	1.1.1.10.4	Electronics Racks	257
	1.1.1.10.5	Cryogenics	191
	1.1.1.10.6	Detector	242
	1.1.1.10.7		433
			198
			147
			73
			7
			9
			128.1
		NSB infrastructure magnets (3rd sh.)	200.0
		<b>NUSTAR Subtotal</b>	<b>1,077.0</b>
PANDA	1.4.1.18.1	Supports	2,400
	1.4.1.18.2	Supplies	760
	1.4.1.18.3	Controls	400
	1.4.1.19.4	DAQ	980
		<b>PANDA Subtotal</b>	<b>4,540</b>
		<b>Total</b>	<b>7,890</b>

We'd like to ask the RRBs to recognise that CBM, NUSTAR and PANDA propose to finance some infrastructure components in the experiments' responsibility via Common Funds

heterogeneous community, potential amounts very small

# Draft Construction MoU for CBM



- The CBM collaboration agreed on a draft Construction MoU
  - Distributed with the documents for the RRBs
- Open for discussion and feedback from the funding agencies
- To serve as a model for other FAIR collaborations

CBM Collaboration

Memorandum of Understanding

25.09.2018

## Memorandum of Understanding

for Collaboration in the Construction of the  
Compressed Baryonic Matter (CBM)  
Experiment at FAIR

between

the Facility for Antiproton and Ion Research in Europe GmbH, hereinafter referred to as  
FAIR, as the Host Laboratory

and

the institutions forming the CBM Collaboration  
(hereinafter referred to as "Institutes") together with the corresponding funding agencies

### Preamble

The institutions forming the CBM Collaboration and FAIR have agreed to collaborate in order to perform a unique experiment and by thus studying the properties of nuclear matter at the highest baryon densities. The CBM Experiment shall be jointly constructed by the Institutes and established at FAIR.

FAIR will serve as the Host Institute and build the experimental area for the Experiment (CBM cave).

FAIR will evaluate and accredit the Technical Design Reports (via the Expert Committee Experiments, ECE), which will be the basis for the construction of the CBM experiment. FAIR will monitor the construction costs via the Resources Review Boards.

The CBM Technical Coordinator and the CBM Resource Coordinator are besides the spokesperson the link persons between the CBM Collaboration and FAIR.

The CBM collaboration has signed in 2012 a *Pre-Construction* Memorandum of Understanding in order to affirm the intention of the Institutes to build the CBM Experiment. In particular the Institutes declared to take over responsibilities for the construction of the different CBM Sub-Systems. In the *Pre-Construction* MoU the Institutes expressed their intention to provide corresponding construction funds or to submit funding applications to their ministries or funding agencies.

This MoU comprises the start version of CBM to be realized at SIS100. The CBM "day 1" setup is defined as well (**Annex 10**), which is funded to larger extent. The Institutes confirm in this MoU to contribute In-Kind or with manpower to the construction/realization of the CBM experiment.

The CBM collaboration and the HADES Collaboration signed a Memorandum of Understanding to regulate the installation of the both experiments in the Cave, the sharing of detector equipment and to work out a proposal for the initial phase of the compressed baryonic matter research program to be performed by CBM and HADES with the beams from the SIS100.

# Structure of draft MoU for CBM



Main body text of MoU

Annexes:

- List of Institutions (and names of the Collaboration Board members) forming the CBM Collaboration
- List of Funding Agencies and their Representatives
- List of the members of the CBM Collaboration given by Country and by Institute
- Organisation rules of the CBM Collaboration, Management structure of the CBM Collaboration, Management Board members and of persons holding management positions in the CBM Collaboration
- Detailed compilation of the Construction Cost and Funding of the Detector/Subsystems, and of Responsibilities for the Construction Workpackages by the Institutes.
- Summary Tables on Construction Cost and Funding with the Values of Commitments by Funding Agency to the CBM Detectors/Subsystems.
- Status of Technical Design Reports
- List of substantial manpower contributions of Institutes to Subsystem Construction, to Computing Subprojects, to the Physics Working Groups and to Preparation and Coordination tasks
- Construction Schedule
- Procedures for the Common Construction Fund for the Cave Infrastructure
- General conditions applicable to experiments at FAIR
- The CBM Day 1 experimental setup

