



# FAIR - Facility for Antiproton and Ion Research

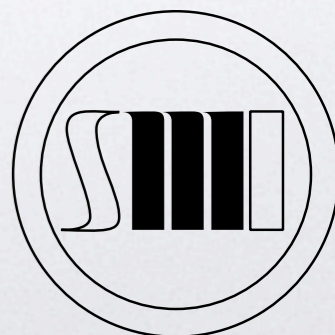
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E. Widmann

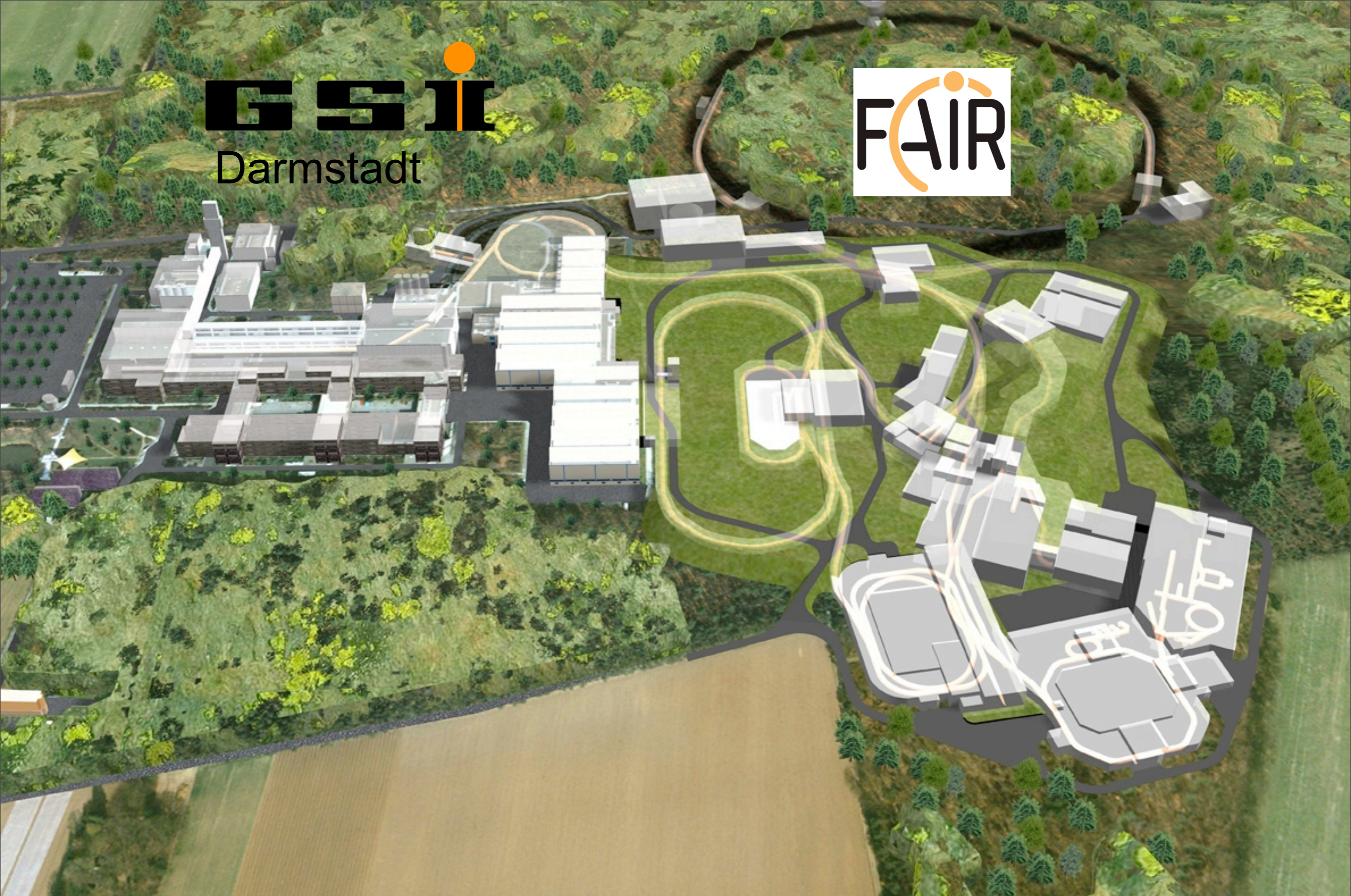


**OAW**  
Austrian Academy  
of Sciences

Stefan Meyer Institute for  
subatomic Physics, Wien

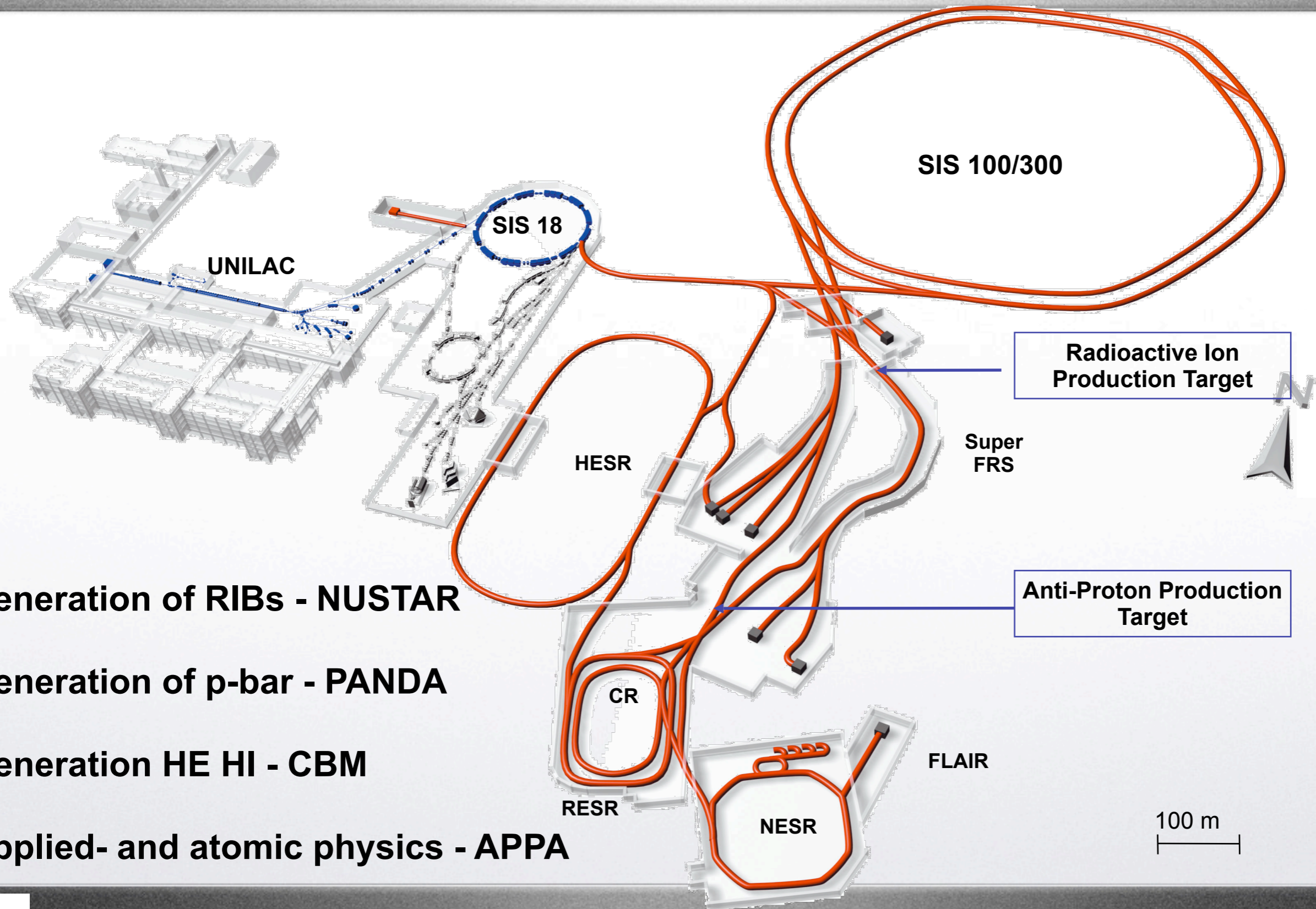


**GSi**  
Darmstadt



Austria    China    Finland    France    Germany    Greece    India    Italy    Poland    Spain    Sweden    Romania    Russia    UK

# FAIR Physics Program



**Generation of RIBs - NUSTAR**

**Generation of p-bar - PANDA**

**Generation HE HI - CBM**

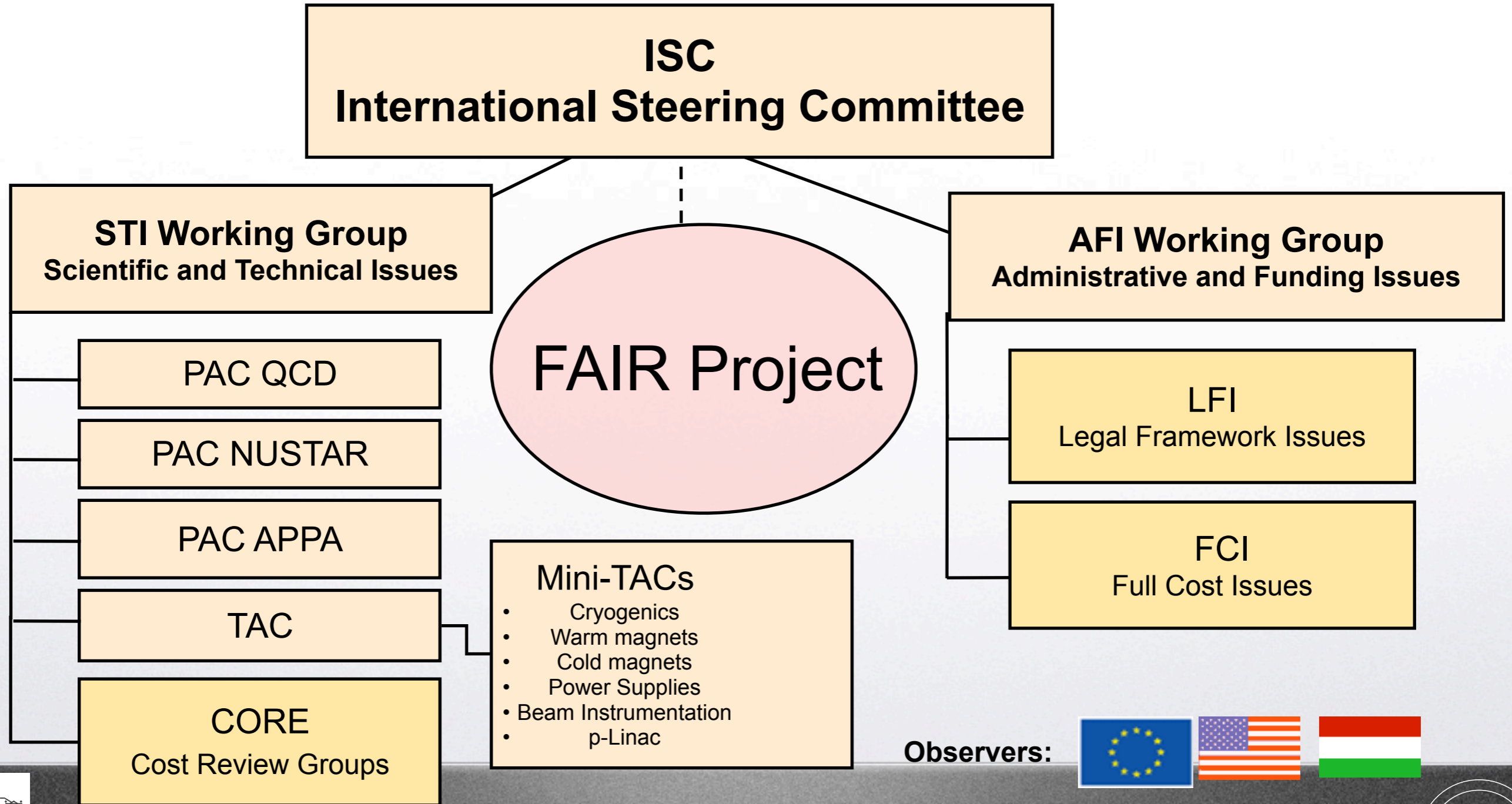
**Applied- and atomic physics - APPA**



# Present Committee Structure of FAIR



*14 potential memberstates*





# FAIR Baseline Technical Report

*Official FAIR project description*

Six volumes of more than 3500 pages by more than **2600 authors**



**Volume 1**

**Executive Summary**

**Volume 2**

**Accelerator and Scientific Infrastructure**

**Volume 3A**

**Experiment Proposals on QCD Physics**

3.1 CBM

**Volume 3B**

**Experiment Proposals on QCD Physics**

3.2 PANDA

3.3 PAX

3.4 ASSIA

**Volume 4**

**Experiment Proposals on Nuclear Structure & Astro Physics (NUSTAR)**

4.1 LEB-SuperFRS    4.2 HISPEC/DESPEC

4.3 MATS            4.4 LASPEC

4.5 R3B             4.6 ILIMA

4.7 AIC             4.8 ELISe

4.9 EXL

**Volume 5**

**Experiment Proposals on Atomic, Plasma & Applied Physics (APPA)**

5.1 SPARC            5.2 HEDgeHOB

5.3 WDM             5.4 FLAIR

5.5 BIOMAT

**Volume 6**

**Civil Construction and Safety**

*For download of the report:  
<http://www.gsi.de/fair/reports/btr.html>*

# International FAIR facility

- Construction cost: ~1200 M€
- label „international“ requires 25% external contribution
  - 14 states have signed MoU and participated in kick-off event
  - Phase A: 940 M€
  - Phase B when additional money will be found
  - kick-off meeting last week



# Kick-Off Event and Symposium on the Physics at FAIR

7 - 8 November 2007  
GSI, Darmstadt, Germany



Registration and information:  
[www.fair-center.org/registration](http://www.fair-center.org/registration)

Registration deadline:  
15 October 2007

Contact:  
[fair-event@gsi.de](mailto:fair-event@gsi.de)  
phone: +49 6159 71 2916  
fax: +49 6159 71 3916



Photo from <http://antwrrp.gsfc.nasa.gov>

# Austrian Participation in FAIR

- **Baseline TDR**

**Volume 1**      **Executive Summary**

**Volume 2**      **Accelerator and Scientific Infrastructure**

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5.5 BIOMAT

**Volume 6**      **Civil Construction and Safety**





# Austrian community at FAIR

	Stefan-Meyer-Institut, ÖAW	FLAIR, PANDA AIC (NUSTAR)
	Universität Graz, Theoretische Subatomare Physik	PANDA, CBM FLAIR
	Universität Wien Arbeitsgruppe Kernphysik	FLAIR, PANDA AIC (NUSTAR)
	TU Wien Inst. f. allgemeine Physik	SPARC, FLAIR
	TU Wien Atomsinstitut	NUSTAR, FLAIR
	TU Wien Inst. f. theoretische Physik	SPARC, FLAIR





FAIR

	Projects (in alphabetical order per discipline)	Estimated Construction Cost (M€) *	First possible operations for users	Indicative Operational/ Deployment Cost (M€/year)
Social Sciences & Humanities	CESSDA	30	2008	6
	CLARIN	108	2008	10
	DARIAH	10	2008	4
	EROHS	43	2008	12
	ESS: European Social Survey	9	2007	9
	SHARE	50	2007	< 1
Environmental Sciences	AURORA BOREALIS	360	2010	18
	EMSO	150	2011	20
	EUFAR	50 - 100	2007	2 - 4
	EURO ARGO (GLOBAL)	76	2010	6
	IAGOS-ERI (GLOBAL)	20	2008	6
	ICOS (GLOBAL)	255	2010	13
	LIFE WATCH	370	2014	70
Energy	HIPER	850	2015	80
	IFMIF (GLOBAL)	855	2017	80
	JHR	500	2014	30
Biomedical and Life Sciences	EATRIS	255	2010	50
	European Bio-banking and Biomolecular Resources	170	2009	15
	INFRAFRONTIER	320	2007	36
	Infrastructure for Clinical Trials and Biotherapy Facilities	36	2007	5
	Integrated Structural Biology Infrastructure	300	2007	25
	Upgrade of European Bio-Informatics Infrastructure	550	2007	7
Material Sciences	ELI	150	2013	6
	ESRF Upgrade	230	2007-2014	NA
	ESS: The European Spallation Source	1050	2017	80
	European XFEL	986	2013	84
	ILL 20/20	160	2012-2017	NA
	IRUVX-FEL	760	2006-2015	70
	PRINS	1110	2008-2013	256
Astronomy, Astrophysics, Nuclear and Particle Physics **	ELT: The European Extremely Large Telescope	850	2018	40
	FAIR	1186	2014	120
	KM3NET	220-250	2015	NYD
	SKA: The Square Kilometre Array (GLOBAL)	1150	2014-2020	100
	SPIRAL2	137	2011	7
CDT	EU-HPC	200-400	2008	100-200



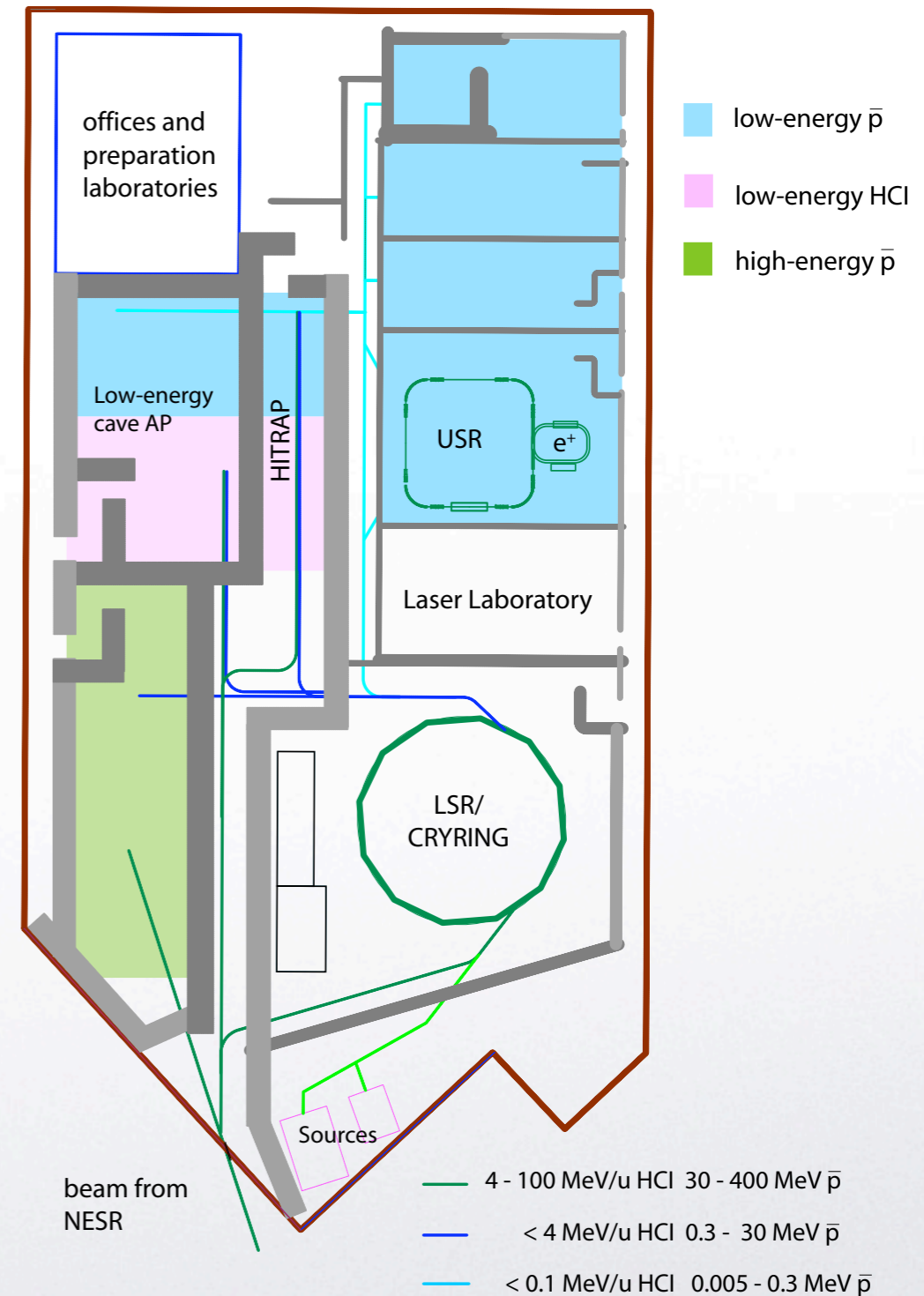
# FAIR related FP6/7 EU contracts

EU contract	scope	Coordi-nating Institution/ Coordinator	Total Budget [M €]	EU financing total [M€]	EU financing FAIR related [M€]	FAIR related total* [M€]
HadronPhysics, Integrated Infrastructure Initiative (I3)	R&D Dense Nucl. Mater, Hadron Physics, EM Probes	INFN / C. Guaraldo	> 60	17.4	10.8	46.7
EURONS, I3 on Nuclear Structure	R&D Exp. & Acc. Nuclear Structure	GSI / Alex Müller, Orsay	35	14,0	2	7
FAIR preparatory phase (FP7) "FAIR"	funding personnel of FAIR JCT & of FAIR GmbH	GSI later FAIR GmbH / J. Eschke	4,9	4,9	4,9	4,9
FAIR Design Study "DIRACsecondary-Beams"	PANDA, HESR, NUSTAR, SIS100, NESR/CR	GSI / J. Eschke	22	9,0	9,0	22
FAIR CNI (Construction of New Infrastructures) "DIRAC-PHASE-1"	SIS18upgrade, HADESupgrade, R3B magnet	GSI / J. Eschke	100	10,4	10,4	100
CARE, I3 on Accel. R&D	Accelerators	CERN / ?	>30	15.2	0,4	0,8
EUROTEV Design Study	TESLA / ILC	DESY / E. Elsen	>18	9	0,1	0,1
Total:					37,6	



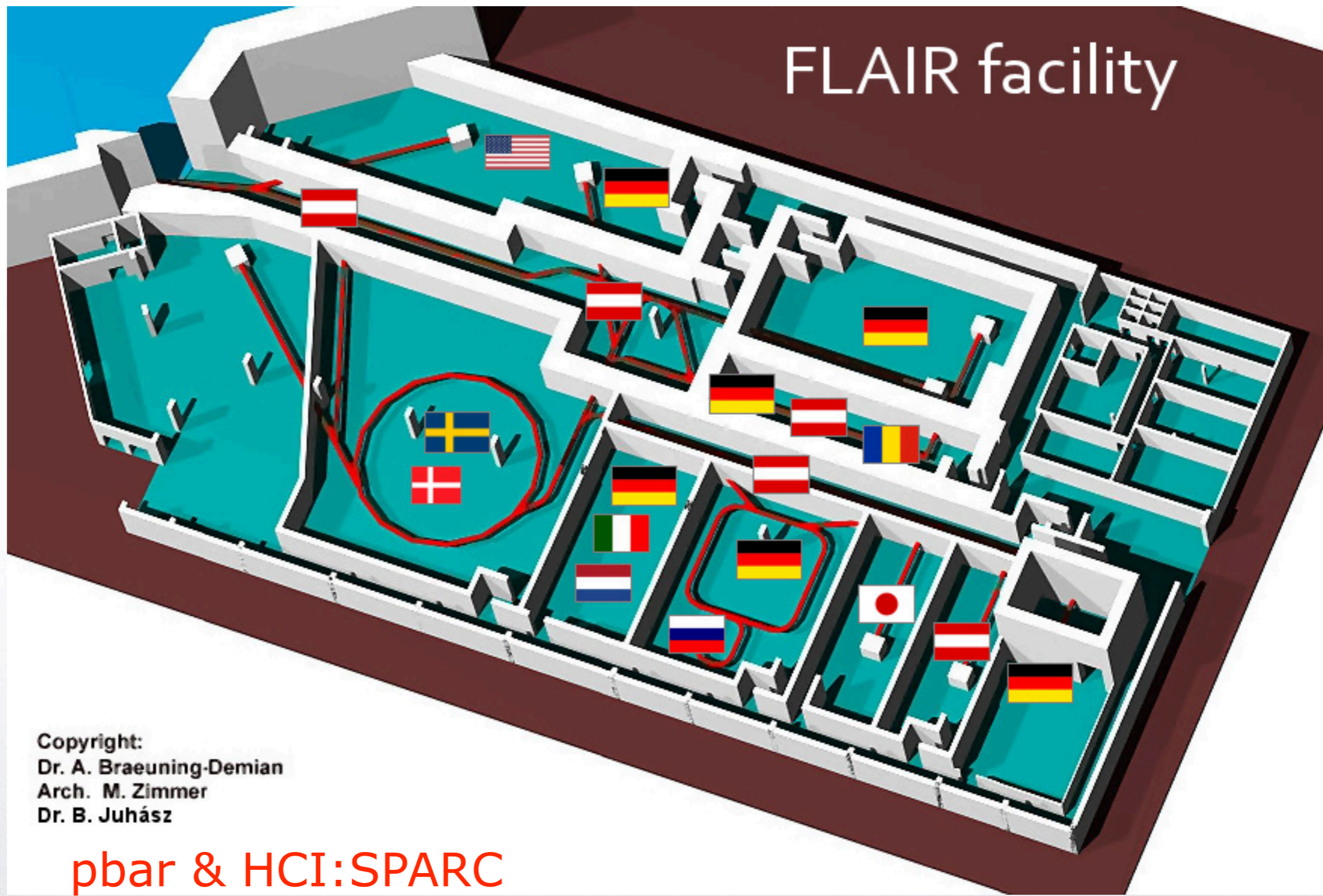
# FLAIR Design Study Application

- 1st call in FP7
- coordinator SMI
- 15 participants
- 4.5 M€ EU contribution
- result: 12.5/15 points
- ffg very helpful for newcomer:
  - presentations & practice
  - proposal check



# next-generation low-energy antiproton facility

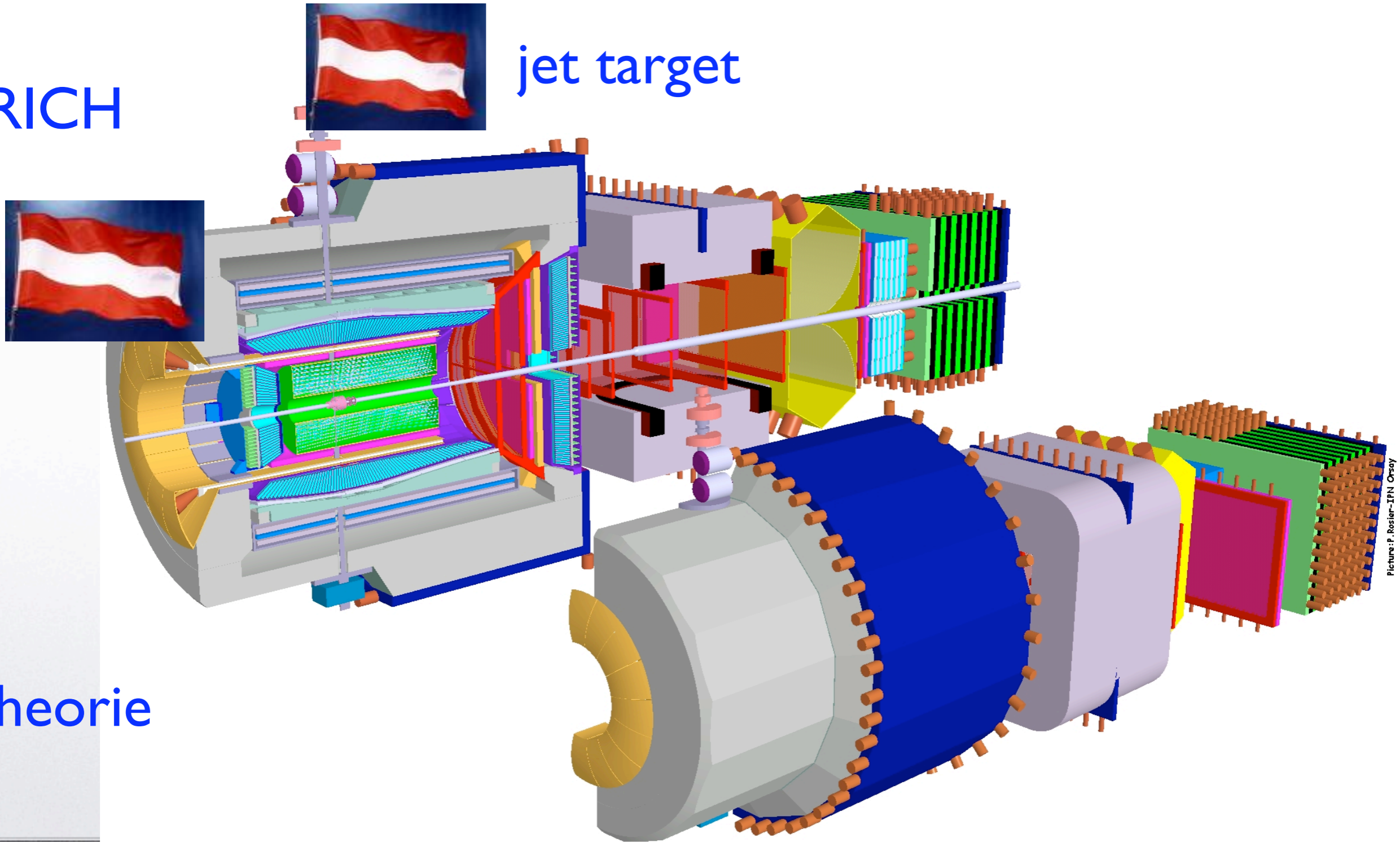
- LSR: SE
- USR: DE
- beamlines: AT
- experiments various sources
- HITRAP



# PANDA: meson spectroscopy

RICH

jet target



Theorie

Picture: P. Rosier-IPN Orsay