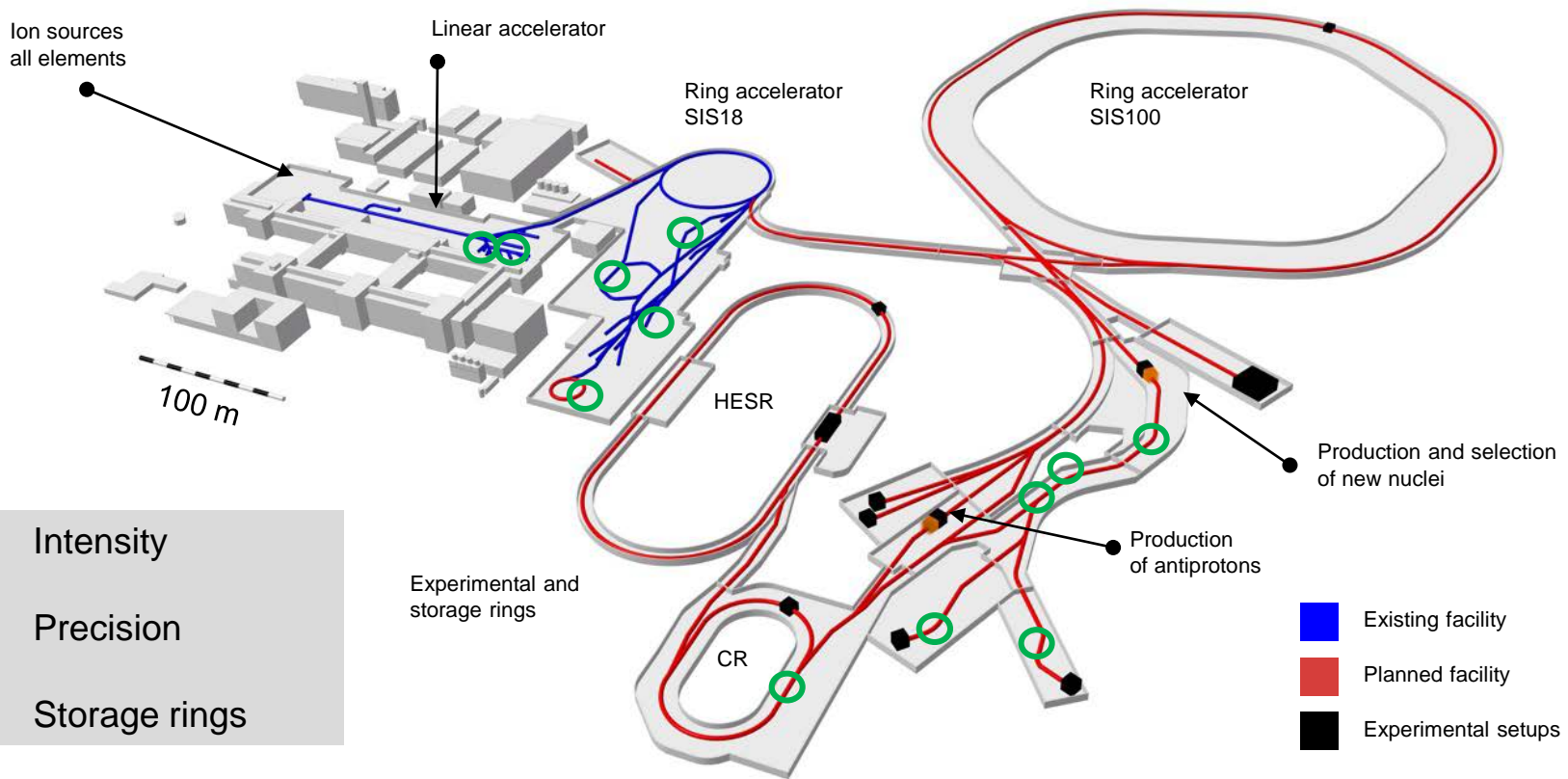




**WELOCOME**

**Paolo Giubellino**



- Intensity
- Precision
- Storage rings

○ NUSTAR experiments

# FAIR construction continues to progress...



Civil construction



Components of accelerators

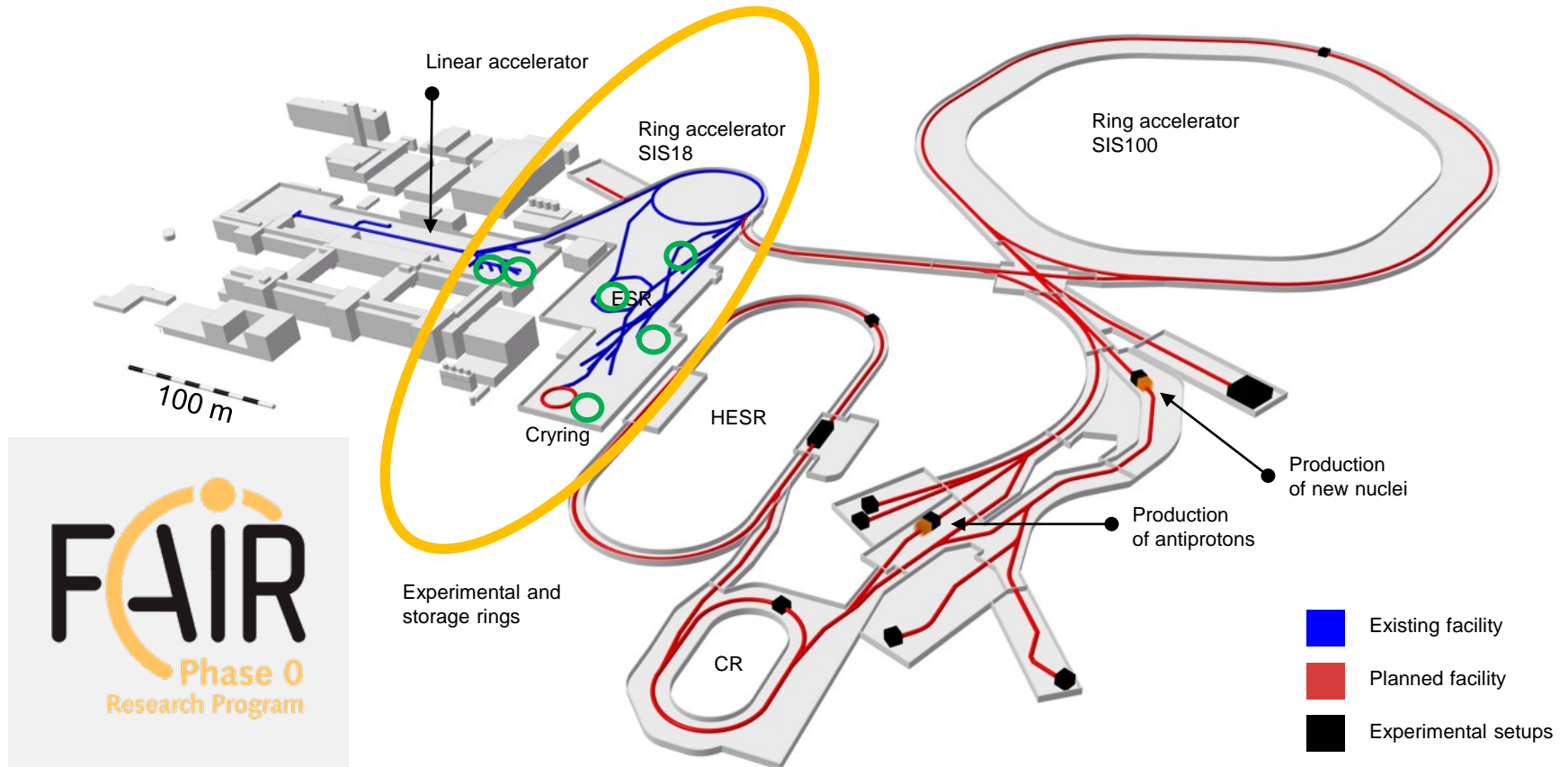


Detectors

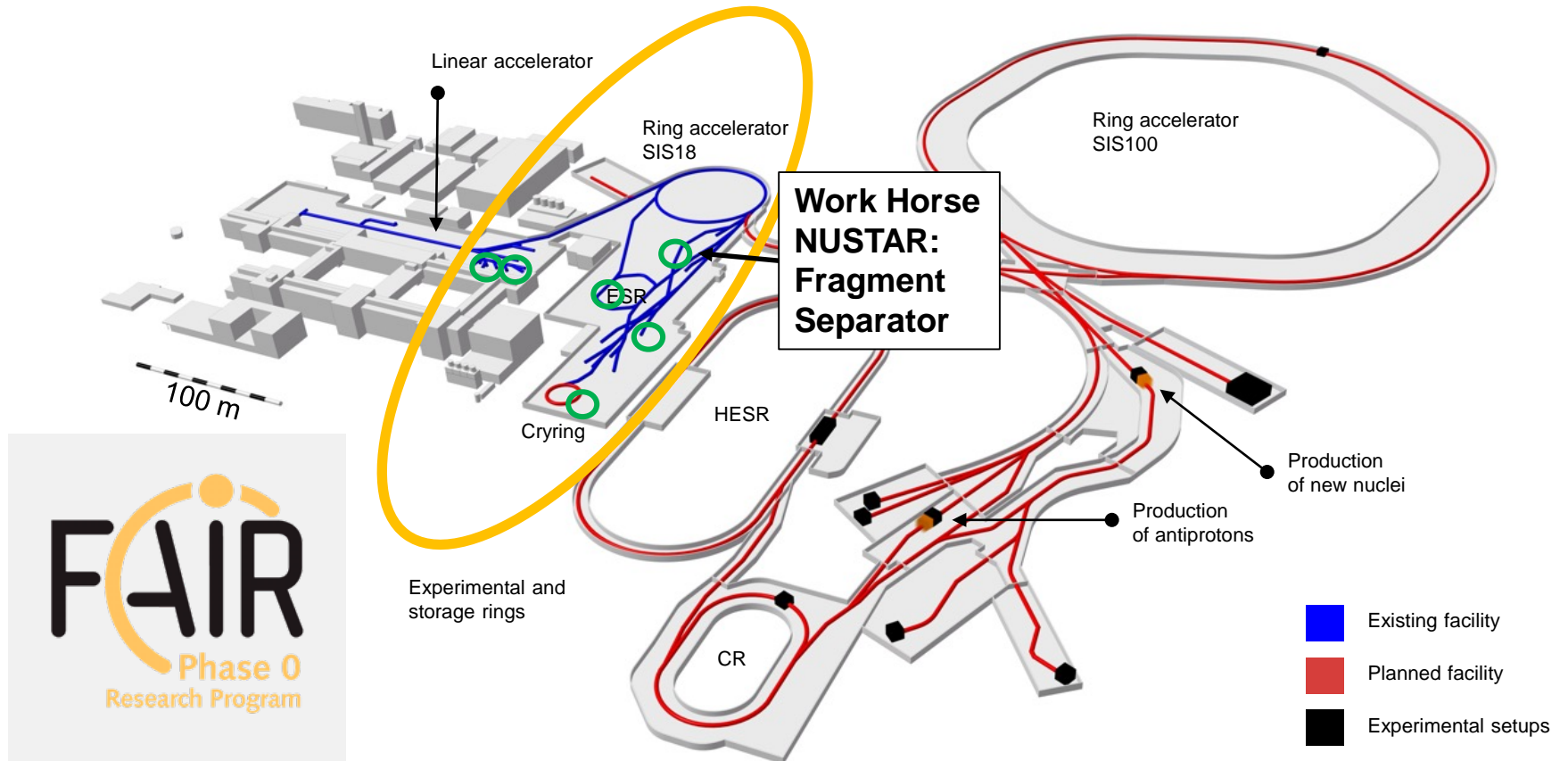
# The construction of the Southern Area has started!



# Early science program FAIR-Phase 0



# Early science program FAIR-Phase 0



# Establish a FRS Experiment support team



## Tasks:

- responsible for FRS operations and provision of experimental conditions requested by the users
- provides training for NUSTAR (sub-)collaboration members on how to do basic FRS operations

## Composition of this support team\*:

- 3-4 FTE from FRS/SFRS Experiment Group at GSI/FAIR
- 3 FTE from SFRS Project Group establishes a lessons learned list and a beam data base
- 2-3 FTE from other scientific infrastructure groups of GSI/FAIR
- ***plus external support personnel from the NUSTAR (sub-)collaborations involved in the experiments ← these resources need to be negotiated!***

\*The GSI/FAIR personnel will be provided for about five to six months per year to cover the preparation, execution and postprocessing of the FRS experiments during FAIR phase 0

- Vital to create the know-how and human capital needed for future success of FAIR
- Develop the scientific community
- Do science while commissioning FAIR elements; unique research capabilities until start of FAIR using the accelerator and detector components while they become available
- Very strong response by international scientific community
- First results from Phase 0 (since 2019) show the huge scientific potential which FAIR will have



# First Years of FAIR Phase-0

- Scientific programme and beam parameters defined taking into account scientific and technical priorities of the FAIR pillars for 3 months of beamtime per year
- 1<sup>st</sup> selection of experiments in 2017: very strong response of the scientific community, many proposals largely exceeding the offered beamtime. Selection based on scientific excellence
- Accident at UNILAC in 2018 , delivered just ~60 shifts mainly to experiments in Materials Research and Superheavy Elements
- Experiments shifted to 2019/2020: all communities were served; due to Covid-19 some experiments (about 1/3 of the ones scheduled for 2020) had to be postponed, resubmitted in the current call

## now:

- 2<sup>nd</sup> 'Call' in 2020 for beamtime in 2021/2022
- Again high overbooking of available time, confirming the attractiveness of the experimental opportunities

## G-PAC:

**Sydney Galès**, CNRS, IPN Orsay, France

Jana Bielcikova, The Czech Academy of Science, Czech Republic

Yorick Blumenfeld, Inst. Phys. Nucl., Orsay, France

Philippe Crochet, LPC, Clermont-Ferrand, France

Paul Greenlees, University of Jyväskylä, Finland

Paul Indelicato, CNRS, Lab. Kastler Brossel, France

Witold Nazarewicz, Michigan State Univ., USA

Gerda Neyens, KU Leuven, Belgium

Marek Pajek, Jan Kochanowski Univ., Poland

Marina Petri, University of York, UK

Thomas Pfeifer, Max-Planck-Institute HD, Germany

Achim Schwenk, TU Darmstadt, Germany

Tomohiro Uesaka, RIKEN, Japan

Eberhard Widmann, Austrian Acad. of Sciences, Austria

## Introduction PACs (II)



### Mat-PAC:

**William J. Weber**, University of Tennessee, USA

Thomas Cornelius, Marseille, France

Yong Dai, PSI, Villigen, Switzerland

Zuzanna Siwy, USA

### Bio-PAC:

Peter Dendooven, Netherlands/ Finland

Oliver Jäkel, DKFZ / HIT, Germany

**Vincenzo Patera**, Italy

Yolanda Prezado, France

Charlot Vandevoorde, South Africa

### PPAC:

**Peter Thiolf**, Technical University Munich, Germany

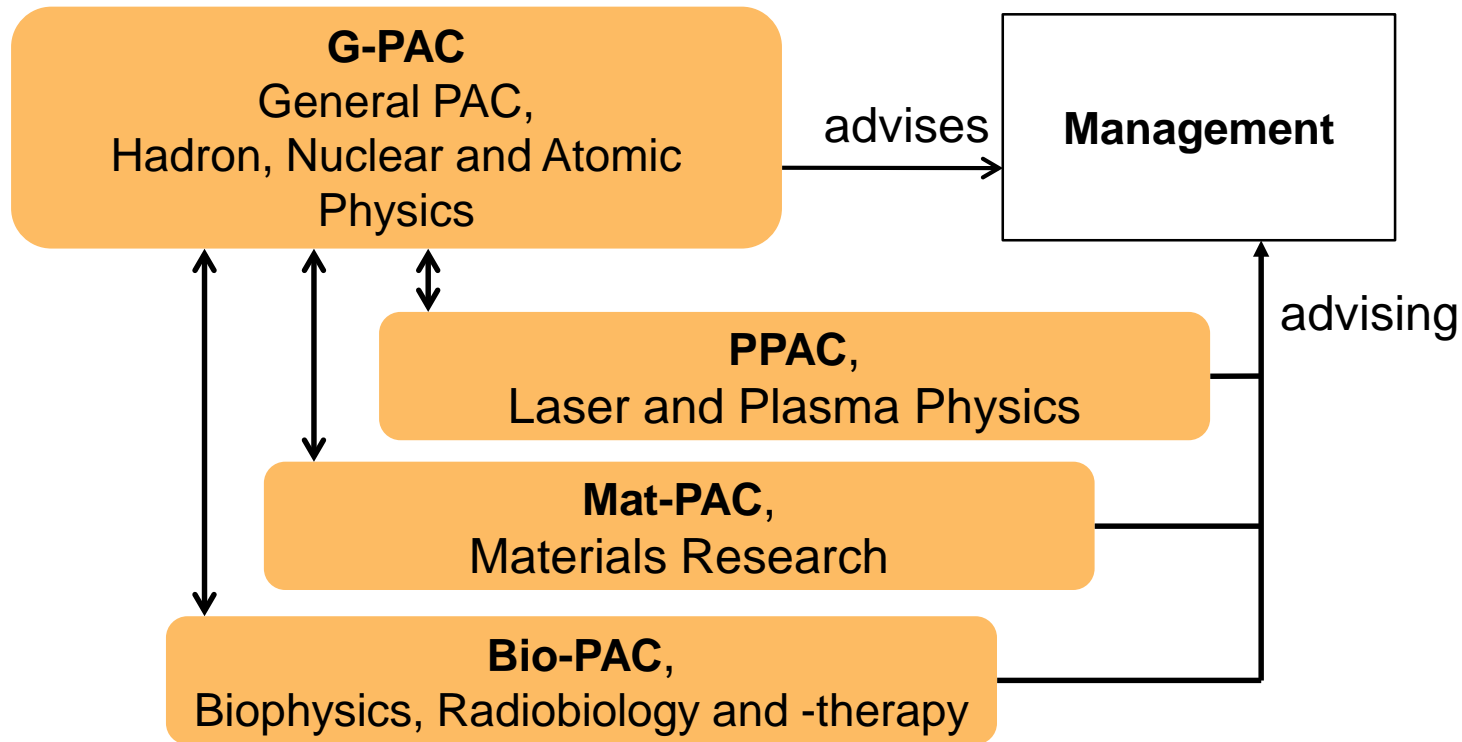
Brigitte Cros, CNRS, Univ. Paris-Sud, France

Igor V. Lomonosov, RAS (IPCP), Russia

Kurt Schoenberg (HED@FAIR Collaboration), Los Alamos, USA

Prof. Dr. Ulrich Schramm, HZDR, Germany

# PAC Structure and Organization



## Organization:

Sub-PAC Chairs report to G-PAC;  
PACs recommend the directorate  
to grant beam time

**Total of 173 proposals / 4.253 shifts:**

G-PAC: 95 proposals / 3.215 shifts

Mat-PAC: 31 proposals / 425 shifts

Bio-PAC: 27 proposals / 133 shifts

PPAC: 20 proposals / 430 shifts

ERC-related: 3 proposals / 50 shifts

# Beamtime-Planning for UNILAC

(for 2021-2022; distributed in 2020)

Plan: Allocation of about **420 shifts** for UNILAC experiments

'Distribution' up to:

- Heavy Elements / Nucl. Struct. (NUSTAR):  
**265 shifts** (request 497 shifts – thereof 3 shifts re-submission) } **G-PAC (63%)**
- Materials Research\*: **143 shifts** (request 288 sh.) **Mat-PAC (34%)**
- Biophysics\*: **8,4 main shifts** (request 13,3 shifts) **Bio-PAC (2,0%)**
- Plasma Physics\*: **4,2 main shifts** (request 9 shifts\*\*) **PPAC (1,0%)**

\* 10 parasitic shifts count as 1 main shift; values here given in main shifts.

\*\* PPAC15 Meeting scheduled for October 5-6, 2020 (UNILAC and PHELIX proposals).

# Beamtime-Planning for SIS18



(for 2021-2022; distributed in 2020)

Plan: Allocation of about **470 shifts** for SIS18/FRS experiments

'Distribution' up to:

- HADES / CBM / NUSTAR:

**341 shifts** (request 1.723 shifts – thereof 112 shifts re-submission) } **G-PAC (78,2%)**

**New addition: 80 more SIS18 shifts for G-PAC, to a total of 421 shifts**

- Materials Research\*: **31 shifts** (request: 77 sh.) **Mat-PAC (7,1%)**
- Biophysics\*: **42 shifts** (request: 120 sh.) **Bio-PAC (9,6%)**
- Plasmaphysics\*\*: **22 shifts** (request: 22,5 shifts\*\*) **PPAC (5,1%)**
- ERC-related requests: **34 shifts**

\* 10 parasitic shifts count as 1 main shift; values here given in main shifts.

\*\* In this year, PP proposals for SIS beam have been submitted via G-PAC44.

Plan: Allocation of **410 shifts** for ESR, CRYRING and HITRAP experiments

'Distribution' up to:

- Atomic Physics / Nucl. Astrophysics (APPA/NUSTAR):  
**369 shifts** (request: 995 shifts – thereof 153 shifts re-submission) } **G-PAC (94%)**
- Mat. Research: **25 shifts** (request: 361 sh. CRYR.) **Mat-PAC (6%)**
- ERC-related requests: **16 shifts** (request: 16 shifts)



# Requests to G-PAC 44 by machine



Machine	Shifts requested to G-PAC Total= main+(sec+para)/10	Shifts available to G-PAC	Overbooking factor	overbooking of G- PAC44 if rank A re- subs are re-granted first
UNILAC	497.3 (3)	265	1.9	1.9
SIS18 / FRS	1723 (111)	421	4.1	5.25
ESR / CRYRING / HITRAP	976 (153)	369	2.65	3.8
$\Sigma$	<b>3215.3 (266)</b>	<b>1055</b>	<b>3</b>	<b>3.7</b>

Numbers in parentheses are shifts granted by G-PAC43 to the unchanged **rank A** re-submissions.  
 Secondary and parasitic shifts count 1/10 of main shifts  
 Numbers without ERC-grant-related proposals

# Quota and recommendations by machine



Machine	Quota	Recommendations	
		A	A-
UNILAC	265	268	57
SIS18 / FRS	421	511	151
ESR / CRY / HITRAP	369	321	80
CRYRING ALONE		117	30
$\Sigma$	<b>1055</b>	<b>1217</b>	<b>318</b>

Overall rankings:

A	42
A-	13
B	29
C	10

all resubmitted proposals ranked A by G-PAC43 have again been ranked A

Numbers without ERC-grant-related proposals

# Requests and recommendations by collaboration



Collaboration	Shifts requested total main+(sec+para)/10	Recommendations	
		A	A-
APPA / SPARC	927 (153)	420	136
HADES / CBM	574.7 (0)	119	49
NUSTAR: R3B	300.8 (23)	164	28
NUSTAR: S-FRS	394 (29)	104	26
NUSTAR: DESPEC	503.2 (59)	145	22
NUSTAR: SHE	447.6 (0)	247	57
NUSTAR: ILIMA	68 (0)	18	0
$\Sigma$	<b>3215.3(266)</b>	<b>1217</b>	<b>318</b>

Numbers in parentheses are shifts granted by G-PAC43 to the unchanged **rank A** re-submissions.  
 Secondary and parasitic shifts count 1/10 of main shifts  
 Numbers without ERC-grant-related proposals

- Will continue with regular beam time allocation until FAIR operations starts
- If exceptionally beamtime becomes available, for example because an experiment is unable to use it, the GPAC will be consulted on its allocation
- Next general call in two years time
- We develop an integrated plan of successive improvements to the accelerator complex to expand the scientific reach of the program
- Be ready for possible difficult times, organize ahead!
- Please refer to FAIR Phase 0 in talks and publications of results, and use the logo!



An aerial photograph of the NUSTAR construction site at sunset. The sun is low on the horizon, casting a warm orange and red glow over the scene. The construction site is a large, circular area with several yellow tower cranes and various structures under construction. The site is surrounded by a dense forest of trees. In the background, there are some buildings and a road.

**Looking forward to great  
scientific results from NUSTAR  
in the coming years!**

Photo: C. Betz