

Method / Intent of Evaluation

The goal of each LoI final report is clearly to distinguish the science and instrumentation:

- a) **which can and should be employed in the FAIR Phase-0 call of 2023-2024** in terms of excellence, uniqueness, feasibility and readiness,
 - b) **and the science parts which would benefit greatly from the connection of SIS18 to the new caves and the subsequent increase in intensity, transmission, and new instrumentation or other conditions beyond 2025. but also to a different mode of operation at FAIR in which physics runs will not be compact in a three-months period but spread throughout the year, thus making experiments with long installation or commissioning times easier,**
 - c) **plus conclusions on more general recommendations / resolutions** as guidelines for detailing the call for submissions and assessment of proposals in the next regular G-PAC.
- a), b), c) **should help the FAIR Phase-0 program to ensure the best possible science output during this transition period** towards FAIR Day One experiments and clarify our future discussions on the next round of proposals which will be submitted at the next regular G-PAC in September 2022.

ESR (18)

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3-beam (broadband) laser interaction with stored relativistic ions	Danyal Winters	C3+, N4+	Las		1
E137: Experimental investigation of the precision limit for spectroscopic measurements in relativistic, few-electron high-Z ions by the method of resonant coherent excitation (RCE) of ions in a crystal.	Angela Bräuning-Demian	U89+	RCE		2
Electron-impact excitation of the heaviest helium-like ion (U90+) in relativistic collisions	Alexandre Gumberidze	U90+	T	S	3
Exploring the limits of bunched beam laser cooling of relativistic stored ions	Danyal Winters	C3+	Las		4
High-resolution measurements of the 1s(2s)² state decay branches in Li-like uranium	Sergiy Trotsenko	U88+	T	S	5
Investigation of light phenomena observed during interaction of highly charged ions with a liquid droplet beam target	Nikos Petridis	U90+	T	S	6
Laser spectroscopy of the (1s2 2s2p) 3P0 - 3P1 level splitting in Be-like krypton	Danyal Winters	Kr32+	Las		7
Multi-Electron Emission from Projectile Ionization of U28+Ions at Relativistic Velocities in Heavy-ion Storage Rings Letter of Intent (LOI) for Continuation Request for Proposal E117	Siegbert Hagmann	U28+	T	C	8
Nuclear Hyperfine Mixing and Laser Excitation of H-like 229Th89+	Carsten Brandau	Th89+	Las	C	9
Probing ultra-short-lived excited states in Be-like Carbon at the ESR	Jan Rothhardt	C2+	Las	C	10
Proton capture on 91Nb in ESR	Jan Glorius	Nb41+	T		11
Radiative Electron Capture Studies for Bare Uranium Ions in Collisions with Spin-Polarized Target Electrons	Pretz/Stöhlker	U92+	T		12
Rate Measurement of the Nuclear Excitation by Electron Capture process	Yury Litvinov				13
Towards testing three-loop effects of bound-state QED in He-like uranium	Martino Trassinelli	U90+	T		14
X-ray spectroscopy of slow Xe54+ + Xe collisions	Pierre-Michel Hillenbrand	Xe54+	T		15
Hyperfine Structure in 208,209Bi80+,82+ - a Test of QED in Strong Magnetic Fields	Wilfried Nörtershäuser	Bi82+, 80+	Las	C	16

ESR (18)

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Influence of hyperfine interaction on the nuclear electron capture decay in ^{64}Cu	Ragandeep Singh Sidhu	$^{64}\text{Cu}28+$, $27+$			17
Bound state beta decay of ^{205}Tl (possible resubmission)	Guy Leckenby				18

CRYRING@ESR (12)

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Absolute rate coefficients from dielectronic recombination for astrophysically important ion species	Michael Lestinsky	NeQ+	C	LI	19
Atomic processes in the wake of neutron-star mergers: Electron-ion recombination of low-charged heavy ions	Stefan Schippers	>XeQ+	C	LI	20
Commissioning and First Storage Ring Experiments of the Transverse Free-Electron Target	Carsten Brandau	O7+, 6+ > Xe53+	ET	LI, ESR	21
Fast Ion – Slow Ion Collisions for Atomic Physics (FISIC @ CRYRING)	Emily Lamour		FISIC	LI	22
High-resolution electron-ion collision spectroscopy of beryllium-like heavy ions in CRYRING@ESR	Stefan Schippers	e.g. U88+	C	ESR	23
High-Resolution Spectroscopy of X-Ray Transitions in He-like Uranium at the CRYRING@ESR	Günter Weber	U91+	C	ESR	24
Indirect measurements of neutron-induced reaction cross sections at storage rings	Beatriz Jurado	U92+	T	ESR	25
Measurement of the astrophysically relevant alpha-capture reaction rate $Ti-44(\alpha,p)V-47$	Oliver Forster	TiQ+	T	LI	26
Nuclear astrophysics with CARME@CRYRING	Carlo Bruno		T	LI, ESR	27
Systematic measurement of electron capture cross sections in the low collision energy regime	Nikos Petridis		T	ESR	28
Search fo NEEC at CRYRING	Yury Litvinov	129Sb	Extr.	ESR	29
Ion beam and level population dynamics in Mg+ laser spectroscopy at CRYRING@ESR	Rodolfo Sanchez	Mg+	Las	LI	30

HITRAP (3)

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Charge exchange at low collision energies	Sonja Bernitt	31
HITRAP Experiments Proposal E130 with ranking A	Max Horst	32
Nanostructuring of monolayer graphene by highly charged ions	Anna Niggas	33

Further Selection Criteria (beside scientific excellence)

- Relevance for the future program of the SPARC collaboration
- Support by third party funding
- Internal (GSI) resources needed
- Status of preparation / commissioning
- Readiness // Complexity of experiment (feasibility)