SO2024 — kick off meeting Overview of referee's reports and first steps

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SO2024 evaluation

- The proposal was divided in two parts -report for 2019 – 2023 -SO2024 planning for 2025 – 2028
- -We got 96,6
- One report as summary + 6 referee reports –Summary report giving the grades (0: 100) -Referee reports giving (A-F)

• The SO2024 grade goes from 0 to 100 with 95 being the threshold for SO2024

Score= A: Outstanding; B: Excellent; C: Very Good; D: Good; E: Fair; F: Insufficient

SO2024 facts

- Start date of the SO2024 action is 1st Abril 2025 (SO already running)
- End date (extensions might be possible) is 31st March 2029
- A total of 4.5M€ in 4 years [3.7M€ + 0.8M€ overheads]
- 10 PhD fellowships [10 x 125k€ each]
 - Duration is 4 years
 - Can start immediately after the "publicación resolución de concesión SO"
 - Last possible date for starting a PhD fellowship is 01/01/2028
- I recommend every one of you to re-read in detail the BOE/Convocatoria

Summary of Referee reports

- 1.1 Organisation and management, research ca resources, research facilities and training.
- 1.2 Research Outputs
- 1.3 International Leadership
- PART 1. SCIENTIFIC REPORT SCORE
- 2.1 Scientific and strategic goals linked to the s of the unit, feasibility and monitoring plan
- 2.2 Horizontal strategic objectives and activities recruiting; internationalization; exploitation and research outcomes; driving force
- PART 2. CENTRE'S STRATEGIC PLAN SCORE
- General Score

	#1	#2	#3	#4	#5	#6	Glob
pabilities, human	A	A	A	B	B	A	19,2
	A	A	Α	A	A	A	19,6
	A	A	A	A	A	A	9,8
							48,6
scientific activities	B	A	A	B	A	A	28,8
s: training and diffusion of	B	A	A	A	A	B	19.2
							48/
	Α	Α	Α	Α	Α	Α	96,6

IFAE is a major player in fundamental physics, covering particle physics, astrophysics, and cosmology. It has a strong reputation due to high-level physicists, excellent technical contributions, and focused management. Recent efforts to develop local expertise networks will be beneficial. The strategic shift towards gravitational waves, leveraging Severo Ochoa funds, alongside strengths in applied physics and quantum technology, is well-justified and should be praised. The institution has exceptional research output, leadership, and interdisciplinary collaborations.



Summary of Referee reports 1.1 Organisation and management, research capabilities, human resources, research facilities and training. 19,2/20

Why 4xA / 2xB ?

The Institut de Física D'Altes Energies (IFAE) has an organization well-structured, with a balanced focus on experimental and theoretical physics, supported by a strong technical division. Close collaborations with Barcelona research centres and excellent infrastructure strengthen its standing. The technical division is highly specialized, supporting both research and industry.

Talent recruitment strategies, particularly for early-career researchers, are effective. The emerging field of quantum technologies is appropriately covered as well. Administrative processes could be streamlined.

Gender diversity among senior researchers remains low but has improved.

[just the sentences could eventually explain his/her "B"]

REF#4.

The topics studied in the Theory Division are mostly well connected to the goals of the experimental groups, but work in some areas, such as in axion physics, appears to be performed in a relatively isolated way.

Efforts to recruit more female researchers are well designed and relatively effective.

REF#5.

However, as IFAE is well aware of, one has to note that the gender balance is far from satisfactory (only one woman out of the 11 top leaders). Actions are central in the new proposal indeed.













Summary of Referee reports 1.2 Research Outputs

Why 6 x <u>A</u> ?

grants, and contributions to major experiments (ATLAS, DUNE, Virgo).

Its technological achievements, including patents and spin-offs in medical and quantum technologies, are impressive.

IFAE's interdisciplinary focus is considered a strength.

Knowledge transfer and industrial partnerships are well-developed.

Outreach activities are extensive, engaging students and the public.

external grants.

- IFAE's research output is world-class, with numerous high-impact publications, ERC
- The institute has been highly effective in securing funding, both from core sources and







Summary of Referee reports 1.3 International Leadership

Why 6 x <u>A</u>?

The centre plays a major role in international collaborations and holds significant leadership positions.

career scientists.

funding.

leadership roles.



- It has successfully attracted top researchers and maintains a high fraction of early-
- Competitive funding from the EU is exceptional and compensates for moderate base
- Leadership is demonstrated across theoretical and experimental projects, particularly in the Einstein Telescope. More effort is needed to improve female representation in



Summary of Referee reports 2.1 Scientific and strategic goals linked to the scientific activities of the unit, feasibility and monitoring plan

Why 4 A / 2 <u>B</u> ?

The strategic plan is clear, ambitious and aligned with emerging research trends, focusing on gravitational waves, quantum technology, and applied physics. International leadership is a priority, leveraging technical expertise for major European projects such as the Einstein Telescope. Investments in medical physics and quantum technologies are appropriate measures to enhance scientific and societal impact of the centre.

REF#1

IFAE plans to improve the current productivities and manpower by 10-20% by 2028, which is reasonable. However, it is not obvious that they can increase their leadership role in international collaborations as they wish since there are factors that go beyond their control. In addition, increasing the fraction of female among the permanent senior researchers by 10% is also challenging but not impossible as the pool is limited.

REF#4

The internal organisation is basically adequate, even though it relies on existing structures. Alleviating administrative procedures has been mentioned as a goal, but not much on how to achieve it has been said. The envisioned budget is well aligned with the objectives. The monitoring plan to fulfill them is also well devised. However, the envisaged increase for some indicators is not particularly ambitious.









Summary of Referee reports 2.2 Horizontal strategic objectives and activities: training and recruiting; internationalization; exploitation and diffusion of research outcomes; driving force

Why 4 A / 2 <u>B</u> ?

IFAE offers strong training and recruitment programs, emphasizing early-career researchers and interdisciplinary collaboration. Outreach activities, including interactive public engagement, are robust.

Open science, industry collaborations, and AI research integration are commendable.

The strong relationship with the industrial community in the Barcelona region is noticeable.

Future plans, including hiring top researchers, will strengthen and foster interdisciplinary research and experimental-theoretical connections. Expansion plans require careful management to ensure sufficient infrastructure and resources.

REF#1

However, the number of postdoctoral trainees and postdoctoral researchers is kind of on the low side.

However, IFAE also plans to recruit a total of 6.06 FTEs (senior researcher), 16 FTEs (postdoc), 10.25 FTEs (technical), 7 FTEs (KTT and Project Office), and 15 pre-doctoral students seems to require more than 10% of the current budget. Furthermore, it is not clear whether their current amount of office and laboratory space is sufficient to accommodate this significant expansion of manpower.

REF#6

All HR aspects are well thought and raise no questions except the gender balance issue. IFAE recognizes the issue and has prepared an affirmative action plan but it must go beyond and put up a plan to give more responsability and visibility to its female researchers already in place. Having one woman out of 10 garantors is a bad situation that must be improved rapidly. IFAE has a long experience in manaing Severo Ochoa Grants (it received it twice in the past) but having a more formal management of the grant is probably to be considered.





Some random impressions

- 1. Having 6 referees instead of 4 helped us
- 2. 96.6/100 is too close to 95/100 to be relaxed for SO2028
 - There is a great level of arbitrariness that but cost you going below threshold
 - There is no guarantee we get SO2028 if SO2024 does not make a real differential impact
- 3. The 3.4 points were lost by
 - Gender balance this time did not kill us but lets take a good note go it 1/2 points lost there
 - Low rate of students and postdocs
 - Doubts about space limitations for infrastructure and manpower increase
 - \circ Non aggressive enough indicators and other non clear little things ? not sure about this





SO2024 principles Driven by common sense

- The SO2024 proposal was successful because it was very sound and had the necessary key words

 - Very targeted on flagship emerging projects with potential [not just a global reinforcement for everyone] • Definitive transversal actions with significant injection of funds
 - Strong statements on training, outreach social impact KTT
 - Demonstrated sensibility to gender issues in every action [affirmative actions mentioned so many times]
- SO2024 actions should translate into measurable differential impact for IFAE
- SO2024 should not generate obligations beyond SO2024 period
- SO2024 should serve to facilitate a successful SO2028
- We should be able to say in 2028 that SO2024 definitively impact the gender balance of our center
- SO award will help IFAE by implementing its SO program
- SO grant cannot become an excuse for DGR to freeze IFAE structural funding
- SO grant cannot become an excuse for IFAE management to bypass structural problems
- SO funds should not be used for structural needs of IFAE

SO2024 strategic goals — as proposed

- research.
- B. To prepare the Institute for the next generation of experimental challenges (HL-LHC and with the necessary start-up funds, infrastructures, training resources, and scientific will serve to attract new generations to our field and to promote women in science.
- C. To consolidate the applied physics research line. The expertise in cutting-edge advantages.

A. To establish IFAE as a leading European institution in the field of GW research, with ET as flagship project, thus placing IFAE at the center of future discoveries in fundamental physics and the future breakthroughs in our understanding of gravity, cosmology and the evolution of the very early universe, for which the use of GWs is regarded as a new revolutionary area of

future colliders, LSST, CTA, Hyper-Kamiokande, and ET), with a renewed leadership, keeping gender and diversity aspects at the core of the considerations, taking affirmative actions to attract scientists and new world-wide recognized young leaders to IFAE, and provide them networking opportunities. Renewed efforts on education and dissemination activities at IFAE

instrumentation for state-of-the-art experiments in particle physics and astronomy constitute a key competitive advantage to generate knowledge and technologies in the areas of medical physics, quantum sensing and quantum computing. IFAEs close relationship with the partner BIST centers that work in photonics or nanotechnology further enhance such





SO2024 actions — as we proposed them 900k€ (PhDs / PostDocs) Personnel **300k€ (Technicians and Al support)**

I. Attracting leading researchers to IFAE, at all stages of development, is a crucial ingredient of our plan... The SO2024 plan allocates a significant fraction of the total funding to recruit postdocs and PhD students. As pointed out, these new personnel will be strategically injected only in those research activities aligned with the SO2024 goals above and with the largest impact, as measured in terms of international visibility, the capacity for being successful in EU calls, with a strong multidisciplinary character, promoting synergies across IFAE research lines, including theory/ experiment close collaborations, or promoting synergies with other BIST centers. A strong policy of affirmative action will be put in place during the recruitment process such that it translates into the identification of excellent female candidates for a significant fraction of the positions.

-> Synchronize with existing programs to co-fund them as much as possible

(Here I need to understand timings and # fellows we might expect...)

-> The plan is sound... lets implement it as it was presented

-> I would like to apply the same philosophy to FPI-SO -- next slide



SO2024 – FPIs – as proposed

7. Predoctorales/Predoctoral positions

Research area

Theory Division

Experimental Division - Particle Physics

Experimental Division - Astroparticle Physics and Cosmology

Applied Physics

- We asked for 15 positions got 10
- I would like to respect the spirit of the proposal
 - Theory ->2 [SM + BSM TBD]

- Particle Physics -> 2 [TBD]
- Astroparticle Physics and Cosmology -> 4 [TBD]
- Applied Physics -> 2 [QCT + Medical Physics TBD]

Want to have this discussion close in 1.5 months time if pe



Only place you might get a bit of coffe **BUT** – remember – Impact !!

- **Facilitate TH EXP common projects**



OSS	sible

SO2024 actions — as we proposed them Training and networking, workshops, visitors..

II. The SO2024 award will increase the existing portfolio of training opportunities offered to young scientists, engineers and technicians. It will promote the organization of topical courses on tools and methods relevant for the day-by-day research activity, and frequent scientific workshops to stimulate international networking and synergies between research lines. Extended research stays for PhD students, postdocs and young staff members in other centers of excellence, and their participation in major internationally recognized topical workshops and schools, will be actively supported, as seed for international networking and to boost their capabilities to promote or participate in EU collaborative research initiatives. Similarly, an extended visitor program at IFAE will be set up to favor scientific exchange at the highest level, and promote IFAE as a hub for new scientific ideas.

- -> This was very well accepted an implementation with real impact is now needed
- -> Lets see also the indicators where we are particularly low

-> Lets make a plan where SO action has a clearly identified impact beyond what is already done

-> For me here the risk is to dilute the impact in many little fronts - definitively this needs discussion







SO2024 actions — as we proposed them

New young leaders

III/ The SO2024 plan will allocate funds to offer two substantial start-up research grants to new research leaders in the broad areas of GW research and medical physics. This aims to facilitate the attraction of two new worldwide recognized scientists (at the equator of their research careers) via highly competitive programs like Beatriz Galindo, ATRAE, or ICREA. These researchers should be of high-enough caliber to apply to ERC grants with a significant chance of success. A strong policy of affirmative action guides these actions: a headhunting committee has been put in place to identify and promote the hiring of female leaders.

-> Maybe some of it we already this by now...

-> This must be implemented with care .. also should cure our gender balance problem at the leadership (PI) level

-> Those startup funds can be also regarded as investment in new infrastructure facilitating their research and beneficial for all groups

-> Note this action also depends on the capacity of IFAE to absorbe new staff in the following years







SO2024 actions — as we proposed them 300k€ (PO & KTT) Support to PO, Communication, KTT **100k€ (Communication)**

IV/ The SO2024 will serve to complement the capacities of IFAE's Project Office via specific training courses, the incorporation of new personnel and the use of professional services specialized in EU programs for the identification of public and/or private EU consortia where IFAE can participate, the preparation of proposals, and the subsequent management of grants. The KTT Office will expand, given the recent success in the creation of several spin-off companies, and in preparation for an enlarged applied physics portfolio. Finally, IFAE's Communication Office activities will be boosted to significantly increase the social awareness of IFAE and IFAE's returns to society in terms of education, training, and the promotion of the interest and scientific vocation of the young people. In this context, gender will be considered a central aspect and affirmative action will take place in the form of dedicated activities for promoting women in science.

-> All PO and KTT actions should be confined within the SO execution period

-> Actions in social awareness are important as they are recognised as significant impact

-> We need to make a definite plan - creation of an interactive showroom - as promised?

-> Can we demonstrate in 4 years our ERC success rate went up thanks to SO actions ? - let's try



SO2024 actions — as we proposed them

Infrastructure

V/The acquisition of key research infrastructure is a pillar of the SO2024 plan. We will upgrade the microelectronics equipment in IFAE's clean rooms with a last-generation flip-chip machine, with 400 times better angular resolution. This is crucial for the ATLAS upgrade, where the demands of the ATLAS innermost pixel layer already lie beyond the capabilities of the current equipment. It is also needed to match the demanding high quality R&D in the production of pixel sensor devices for medical applications, and to meet the requirements pushed by quantum technology development, that in order to scale the prototype quantum processors requires vertical access of the computational units, the qubits. We will also equip IFAE with a new upgraded optical laboratory, and new equipment for reproducing ultra-high vacuum and cryogenic environments in clean room conditions, necessary to carry out delicate tests on new devices and materials for ET and space applications. The new optical Lab will be equipped with powerful lasers of different wavelengths, a resonant optical cavity, new state-of-the-art equipment for the development of infrared light detectors and for optical metrology and characterization of materials and coatings. Whenever possible, SO2024 will be used to leverage on other funding opportunities for the procurement of the new infrastructure. The SO2024 will also be instrumental to strengthen the support in the clean rooms and the new optical Lab with new highly specialized technicians, with competences on optical setups and ultra-high vacuum.

- -> How much of this is already happening via PC?
- -> Is this maintainable and sustainable beyond SO2024?
- -> Can we synchronise with infrastructure calls?
- -> Do we have the space for all of this ?
- -> I want to have a dedicated session on Infrastructures very soon with all the relevant PIs & Tech Div head

-> This is a strong point in the proposal - and very well received - new capacities will lead to a quantum leap in some areas





SO2024 actions — as we proposed them **Seed Money**

VI/ The SO2024 plan includes a seed-money program for R&D and to support new innovative ideas that often need to be kick-started with the institute's own funds, before they can attract competitive funding, particularly if they are proposed by young researchers, with limited track record. Grants will be awarded on a competitive basis among the proposals received internally, and priority will be given to ideas with a better prospect to attract EU funds from early-career scientists, whenever possible, and applying a strong policy of affirmative action. To further facilitate KTT activities and bridge the gap between R&D and the final industrial product, the SO2024 will create its own Proof of Concept (PoC) program, allocating limited funds for one or two projects per year. In addition, SO2024 funds will be devoted to patent protection.

-> Lets put this in motion as it was proposed

-> SO2024 will have to evaluate the proposals and make an internal schedule for calls







SO2024 first steps

- SO2024 needs to hire a SO Project Manager fundamental other wise PO will explode
- Decide soon on the strategy for the 10 FPI-SO fellowships
- Make a detailed 2+2 year plan of execution & financial model
 - This will require time and iterations with PIs & IFAE management
 - Understand relation with PC and ERC-like ongoing actions is SO an insignificant addition to existing efforts?
 - I plan to have a round of F2F meetings with research groups to understand how SO can really impact them
- Run monthly meetings with the SO garantes
- Need to appoint an SO impact committee + SO hiring committee
- Need a close coordination with IFAE management for maximising SO impact
 - Ideally would like to get information on how SO overhead are used to make sure maximise impact \bullet
- Need a close coordination with IFAE administration to protect SO execution & facilitating future reporting
 - Minimise mistakes that might translate into returning significant funds in the near future

Timelines As originally planned assuming T0 = 01/01/2025

- * Fall 2025: First cohort of SO2024 PhD students and postdocs arrive at IFAE -> Early 2026. (??)
- * Fall 2025: New KTT and Project Office personnel arrive at IFAE -> Fall 2025 (SO PO is very urgent)
- * Fall 2025: New AI scientist hired arriving at PIC -> Early 2026 (??)
- * Fall 2026: Second cohort of SO2024 PhD students and postdocs arrive at IFAE -> Fall 2026
- * Summer 2025: New instrumentation at IFAE —> Early 2026
- * Summer 2025: New dissemination material at IFAE —> Early 2026

model – a lot of work involved and interactions with PIs and IFAE management has to happen now

-> Need to coordinate with timeline of Calls for fellowships and infrastructure

-> Ideally I would like to have all clear before summer break if possible

-> I plan to make a detailed plan of funding execution together with the execution plan and financial