

Minutes

ICFA Summer Meeting 2023¹

Melbourne + ZOOM, 16 July 2023

Participation

Note that participation varied over time. The list below gives the maximum participation.

ICFA members (in person): Florencia Canelli, Jun Cai (for Yifang Wang), Stuart Henderson, Geoffrey Taylor, Karl Jakobs, Masanori Yamauchi, Sridhara Dasu, Toshinori Mori, Thomas Schörner

ICFA members (video): Gustavo Gil de Silveira, Beate Heinemann, Lia Meringa

ICFA panel chairs: Yunhai Cai (video), Marcel Demarteau (video), Cristi Diaconu (video), Tatsuya Nakada (in person), Harvey Newman (video), Thomas Roser (video), Chuanxiang Tang (video)

Lab directors and funding agencies: Pierluigi Campana (video), Nigel Smith (video), Joachim Mnich (in person)

Guests: Shoji Asai (in person), Hitoshi Murayama (video)

2. News from ICFA

Stuart Henderson reports on recent news relevant for ICFA since the March 2023 ICFA meeting:

- Membership issues: One ICFA member retired – S. Krishnagopal – and will require replacement. In addition, various terms will come to an end at the end of 2023.
- ICFA seminar: The seminar preparations are in full swing, delegate lists and the scientific programme are being finalized.
- Software panel: ICFA held a discussion with leaders in the software community (on 30 June 2023) regarding a potential ICFA Software Panel. The scope and a draft mandate will be discussed at this meeting.
- The IDT International Expert Panel submitted a report, and the International Technology Network ITN is progressing.
- A nomination for the next ICFA chair has been received, for a term starting on 1 January 2024, and a formal vote will be held in the executive session.

3. IDT and ITN reports and discussion

Tatsuya reports on recent IDT activities and their prospects, in particular for the ITN and the International Expert Panel. He first recaps the history of ICFA's involvement in

¹ All slides can be found on the INDICO page of the meeting: <https://indico.fnal.gov/event/58738/>

the ILC and the different views by ICFA, international partners, and MEXT on the installation of a pre-lab as an expression of interest for hosting the ILC.

In response of the MEXT position regarding the pre-lab, IDT proposed the ILC Technology Network (ITN) and the International Expert Panel, in order to keep the momentum of ILC work.

ITN will execute the time-critical R&D issues identified by IDT WG 2. WG 2 will continue the planning and overall coordination of ILC accelerator activities. The ITN organization is based on bilateral agreements between KEK and partner institutions.

The International Expert Panel (IEP) identifies challenges in the international relations. In particular, there is no consensus across Japanese academia on the realization of the ILC, despite the particle physics community's will to host the machine in the Kitakami region and despite the support by the Diet Member Federation for the ILC, the AAA, and local governments.

The Japanese government continues to view the ILC as a global project, including the aspects of cost and responsibility sharing. In contrast to this, the international expectation is that the Japanese government should express its interest and start to realise the ILC a la HERA or LEP. In the course of the FALC discussions, no common picture on the process of establishing a global project emerged.

In summary, the ITN activities in Europe are on firm ground (e.g. KEK-CERN agreement), and there are expectations that P5 may recommend US participation. Some of the ITN work should start at the end of 2023. The International Expert Panel will explore ways to develop regular interactions among agencies and authorities of potential international partners.

- Sridhara asks about expectations on the P5 outcome. Tatsuya would like to see strong encouragement for Higgs factories and US involvement in R&D towards them. It would be good to see the ILC mentioned explicitly.
- Stuart asks about next steps for the IEP. Tatsuya refers to the identification of the bottlenecks mentioned above; the Japanese HEP colleagues will keep discussing this and the perception of ILC as a global project with MEXT.
- Sridhara points out that FCC will play a role in the P5 discussion. How does ILC fit in this global landscape with also CEPC, C3 etc. – shouldn't all these things be discussed together? Where could this discussion (globally) take place? Tatsuya suggest ICFA takes over (part of) this discussion and to help in optimizing the global resources. Stuart mentions that a pre-requisite for that would be global recognition for a Higgs factory project. Karl states that this has happened for Europe in the last strategy, and that it might happen for the US with P5. Asia would have to be next?
- Karl asks whether, with the ILC discussion, we are back where we were 10 years ago? E.g. looking at FALC – these discussions did not lead to anything – what would be different now? Tatsuya answers that there is a clearer picture of what would have to happen next – this understanding was not there 10 years ago. And – labs are performing reality checks of their plans, which might converge on the timescale of a year or so. Maybe a convergence on a project that can realistically be built would be a good thing?
- Sridhara emphasizes that CEPC and FCC have as advantages the proton option, which the ILC is lacking. And with leptons, we do not yet have design to take us to the 10 TeV scale. Tatsuya mentions PWA, as being pursued in many places, as a potential avenue towards this goal in the lepton sector. And the question remains whether the 10 TeV regime is the necessary one to reach, which promises new physics.

- Joachim emphasizes that any future project will have to be a global project – but one lab or one region has to take the lead and express interest to host the next machine.

Masanori-san reports on the status of the ITN. The ITN shall execute high-priority tasks from the pre-lab proposal. The organization consists of the Institution Board, the Coordination Group, and the Funding Agency Oversight Forum.

Concerning the status, an agreement between CERN and KEK was signed a week ago, CERN acting as a coordinating and facilitating hub for the ITN, distributing the available financial support in Europe. In January 2023, delegations from IDT and KEK visited the US DOE to make a proposal for collaboration with the US laboratories; the response from DOE is currently being awaited.

Among the work packages being worked on the following ones are emphasized by Masanori-san:

- the SRF cavity development (manufacturing methods, industrial-production readiness, RF performance / success yield etc.);
- the development of positron sources (undulator-driven versus electron-driven sources);
- the final focus system (being tested at KEK's ATF – topics are wakefield mitigation, corrections of higher-order aberrations, training for ILC beam tuning).

Masanori-san discusses the European ITN activities and their five main activity areas (SC RF, sources, damping rings including kickers, final focus and nanobeam. As examples for European activities, Masanori-san discusses the cavities and cryomodule group activities (Saclay, INFN, CERN) and the splittable quadrupole magnet and cold cavity BPM activity (IFIC).

At KEK, ITN activities stretch over several fields – sources, damping ring, nanobeams, beam dump, etc. For this purpose, KEK offers the ATF facility (nanobeams, EAJADE project), and work on SRF is also ongoing (fabrication of 10 cavities, of a cryomodule, and upgrade of the SRF-related infrastructure).

Masanori-san then shows an optimistic ILC timeline, which foresees a construction phase starting around 2030.

- Stuart asks about resources provided by MEXT. They started April 2023; it amounts to 7.5 million dollars per year, with hopes to increase it further.

4. Report from P5 process

Hitoshi Murayama reports on the ongoing US P5 process, based on the Snowmass community study outcome from summer 2022, and organized by HEPAP. P5 is actually a subpanel of HEPAP and can as such have closed meetings. The P5 report will be handed to DOE / NSF and also perceived by the executive bodies.

A guiding question for the process was how to develop enabling technologies for a long-term vision in a fashion executable in 20 years. For the Higgs factory, the US role needs to be defined, as well as the scope and technology. The scope of activities on the cosmic frontier needs to be defined, and the amount of embracing gravitational wave activities needs to be discussed.

Hitoshi then sketches the timeline of the open and virtual Town Halls (the open ones are finished). Besides the Town Halls, there were numerous other community encounters. Currently the process is in the deliberation phase, with four closed meetings from May to July 2023. Preliminary recommendations will be given to agencies in August, and the full report is due in October 2023. In looking back to P5 2008, Hitoshi emphasizes that P5 can also change the scope of what is regarded as HEP in the US. P5 2014 was recognized by politics as "having got it right", having made many hard choices, and it led to a budget increase of 45%. Priorities coming out of P5 2014 were HL-LHC, DUNE, CMB-S4, DM G2, again changing the boundary conditions of the field.

Hitoshi then reports on the development of HEP budgets, which for many years failed to keep up with inflation / consumer price indices and only lately were able to catch up again (with P5 2014, especially thanks to DUNE). However, the increase did not fully reach the research part of the budget, but mostly went to technologies and projects. Here, a new balance needs to be found.

Hitoshi then explains the charge on P5 2023 and the various budget profiles proposed for planning exercises. In particular scenario A would require very hard choices, as it corresponds to a shrinking budget. In particular, during the next 5 years of LBNF/DUNE construction, there is very little room for projects.

A Costs/Risks/Schedule Committee under Jay Marx has been installed to help to understand the maturity of cost estimates in the P5 process better. They are now iterating with the "big" projects and will soon turn to the medium and small ones.

- Karl asks about the available budget for projects, running down after the DUNE construction. Hitoshi explains the corresponding graph.
- Tatsuya asks about the running commitments – how are they being taken care of, how to ensure that they can be fulfilled? Hitoshi answers that in scenario A the current commitments cannot be fulfilled – and further reductions of research, operations etc. would become necessary. Also joining the ITN would go to the research budget, reducing other parts of that.
- Lia asks about the high number of projects within the HEP portfolio.
- Geoff asks about the P5 perspective on a potential decision towards a Higgs factory. Hitoshi mentions the P5 outcome and the next update of the European strategy – this requires decision points in the relevant strategy processes. Hitoshi points out that the Office of Science takes a very helpful stance and really cares about the HEP strategy, and that given all scenarios the US can also be a reliable partner in the mid-term future for global projects.

5. Laboratory and regional reports

ICFA heard regional and lab updates.

IUPAP / C11 (F. Canelli)

- Two news items from IUPAP: There is an inter-commission symposium – sustainable development as an interdisciplinary topic between all commissions; it is discussed in October at the executive meeting, and Florencia will monitor how to contribute. And a new early-career award was set up by IUPAP for people working interdisciplinarily.
- Two news from C11: We have added new associate members to balance participation across regions (from Canada, China, Brasil). In the afternoon C11 session, the panel will discuss the balance between in-person and remote meetings.

- Lepton Photon 2025 does not have a proposal to host. C11 is working to develop a potential host.

Latin America (G. Gil da Silveria)

- Concerning the Brazil Associate membership with CERN, Gustavo sketches the path of Brazil to CERN associate membership.
- A meeting on the EIC took place in Sao Paulo in May 2023, including a round-table discussion on opportunities for Latin America and ideas on mobility for students.
- During the LISHEP conference, Brazilian opportunities for entering the FCC Collaboration were discussed.
- In Argentina, La Plata University started discussing R&D for FCC, trying to drive more groups to participate.
- In Brazil, a grant for research at the CERN experiments ("CERN-Brazil") will hold its first meeting on 25 September. It is organized in 8 working groups, mostly focusing on R&D and infrastructure, and including a mobility component.

Asia, Near / Middle East (G. Taylor)

- A new ACFA HEP sub-committee was approved, to be chaired jointly by the IHEP and KEK directors. There will be a first meeting soon; there is hope to get a clearer picture of one Asian view on future machines (ACFA was created 20 years ago, and there is some unclarity on its scope ...)
- Geoffrey presented the timeline for the underground laboratory SABR – the first part of the funding was released, now they are getting radiation shielding in major installations in place throughout the next year.
- Crystals are under development; work is ongoing with Italian collaborators in Gran Sasso, with R&D also in the US

Japan and KEK (M. Yamauchi)

- The on-going experiments at KEK comprise Belle II, the T2K long baseline neutrino experiment, and a flavour physics programme with KOTO, COMET and muon g-2 EDM
- SuperKEKB exhibits the world's highest peak luminosity – thanks to the nanobeam scheme and a powerful injector linac. Belle II is optimized for *B*, *D*, *tau* physics.
- SuperKEKB is currently in a long shutdown, will come back to operation in December 2023, with luminosity of $2.5 * 10^{35}$. The further perspective is not clear, but a further long shutdown is needed.
- At J-PARC, physics is performed in the hadron hall, at the neutrino facility, and at MLF (here also the muon g-2 experiment will be performed).
- For T2K, the proton beam intensity is upgraded to 1.3 MW, and near-detector upgrades are ongoing. This will run until 2026, and Hyper-K will take over in 2027. Hyper-K is done by U Tokyo – approved by Japanese government in 2020, construction started in 2023, and things are going smoothly. KEK plays a role in Hyper-K (proton beamline upgrade, intermediate water Cherenkov detector, etc.).
- The proton beam intensity upgrade is facilitated mainly by new magnet power supplies.
- With the high-intensity proton beam, there are two muon programmes: COMET at Hadron Hall – search for muon-to-electron conversion – phase 1 to start in 2022. The other programme g-2/EDM at MLF is approved
- Stuart asks about the 1.3 MW upgrade – can T2K also run with this? Masanori confirms that.
- Geoff asks about the g-2 timeline. Masanori answers that only part of the funding is approved; but maybe full construction can be started in 1-2 years.
- Stuart asks about the SuperKEKB operation. Masanori states that electricity costs are twice as high as before, and therefore operation time is limited by a factor 2 per year

- that means 3-4 months per year. There might be additional funds, though, in the future.

- There is a discussion on a muon-electron collider.
- Yunhai asks about the Run 2 for Belle and the luminosity – how to achieve that? Masanori says that many things are being worked on – e.g. addressing limitations from beam masks, beam scrapers, etc..

China and IHEP (J. Cao for Yifang Wang)

- The 50th anniversary of IHEP will be celebrated tomorrow!
- BEPC-II reached luminosity of $1.1 \cdot 10^{33}$ in January 2023 – 10% higher than design; luminosity production is going very well. The machine shall run until 2030. The machine discovered 3 new hadrons in 2023 – 26 in total at BES-III. BES-I-III published 500 papers!
- Daya Bay published the final results and is now shut down.
- JUNO is being installed – major installations will be ready in 2023; filling and (first) data taking will happen in 2024. Also the JUNO-TAO near detector prototype will be operational at the same time as JUNO.
- The High Energy Photon Source HEPS has its civil construction finished; the linac saw first electrons at 500 MeV; booster commissioning takes place this month, 167 out of 288 girders are installed for the storage ring, the installation of 5 BL hutches is under way
- The China Spallation Neutron Source upgrade was approved and funding is available – the construction period is 6 years. This comprises a power upgrade from 100 to 500 kW.
- There was a CEPC and SppC review in June in Hong Kong, and the TDR was completed, will be published soon; SRF cavities satisfy requirements, 2nd klystron achieved 70% efficiency (goal was 77% - improvements are underway). Successful prototyping of magnets, vacuum components, power supply, beam diagnostics etc. is ongoing,
- There is progress on the “4th Detector Concept” – silicon combined with TPC or drift chamber for tracking and PID, ECAL based on crystals with timing for PFA, R&D for better scintillation glass HCAL for better hadron sampling and energy → there are lots of R&D, with testbeams at CERN and DESY for calorimeters, vertex detector, drift chambers etc.
- Preparation for the 15th 5-year plan for large science projects is ongoing – HEP as one of 8 groups has been working on this for one year. 15 proposals were collected, and 9 were selected from HEP, with CEPC ranked number 1. A final report will be submitted to CAS for its consideration. 5-year plan will start in 2025. This might lead to an application for funding for CEPC in the next 5-year plan.
- Concerning international cooperation, there is lots of activity at CERN (e.g. for the LHC experiment upgrades) and in Europe, at KEK, in the US; and also at BES-III and at JUNO there are numerous international groups.
- Tatsuya asks about the further selection process in CAS and its timescale. Jun answers that CAS has the right to propose its selection to the central government, probably in 2024. The full report to CAS on CEPC is handed in 2023.

USA / FNAL (L. Meringa)

- DUNE as FNAL flagship project is currently the highest priority. The far-site excavation is going very well – on time and on budget! Excavation is >70% complete. All partners are delivering – in particular CERN, whose FD1 and FD2 prototypes look very good.
- DUNE is managed by an international collaboration with 1400 scientists / engineers from around the world, hosted at FNAL. The DUNE Coordination Office was established in May 2023.

- The Proton-Improvement Plan II (PIP-II) is an essential upgrade to FNAL for DUNE and a broad physics programme for decades to come! The accelerator complex is under construction – the cryogenics plant building is complete, SC accelerator components have been tested, groundbreaking for main building was done this spring.
- The short baseline neutrino SBN programme has the science target to resolve the SBN anomalies with the possibility of discovering sterile neutrinos – this is a P5 recommendation, with detectors SBND, MicroBooNe, ICARUS.
- The collider science programme is taking place at CERN / LHC; FNAL is host lab for the US CMS collaboration and is contributing to the upgrades and provides a remote control centre ... Massive contributions are also done for the HL-LHC accelerator complex (final focus magnets, AUP project).
- There is a programme on precision science with muons: i) muon g-2 – analysis and theory ongoing (experiment ended), and Mu2e project- re-baselined in December 2022, construction 90% complete, start of science is foreseen for 2026.
- Accelerator science and technology are very active – there is e.g. a new record in beam power from the Main Injector with 960 kW.
- There are numerous emerging science and technology capabilities e.g. i) quantum ; ii) AI; iii) microelectronics – FNAL is one of 5 US quantum information centres (SQMS).
- At Berkeley, there are numerous highlights on accelerator R&D: modelling using exascale computing; compact laser PWA with an achieved energy of 8 GeV. The next step here is kBELLA. Berkeley is leading the US high-field magnet R&D in the US; the lab is also building magnets for the HL-LHC upgrade and for other purposes.
- On the cosmic frontier, Berkeley just completed DESY and LZ – they are now taking data to understand DE/ DM, and are launching CMB-S4 (Berkeley as lead lab). The lab is also contributing to the ATLAS Si Strip and pixel detectors, and LBNL leads the LAr TPC near detector for LBNF/DUNE.
- Brookhaven operates RHIC, and in future EIC, and it contributes to many projects. The lab is the host for the HL-LHC ATLAS upgrades (magnets, software), contributes to DUNE (far-detector modules). For the Rubin Observatory, the lab provides data analysis and develops technologies.
- There are numerous synergies between EIC and HEP: accelerators, detectors, etc. EIC physics is expected for the early 2030s.
- Argonne has leadership as a computing facility. They are about to start commissioning the Aurora exascale computer.
- At SLAC, Rubin is preparing for first light, and the lab is hosting the US Data Facility for it.
- At JLAB, the CEBAF physics program is executed, and the MOLLER project is being prepared.

CERN and Europe outside CERN (J. Mnich for F. Gianotti and K. Jakobs)

- LHC will have a short run in 2023, with an early stop in order to save energy costs. There will be 13.5 weeks of pp, then 4 weeks of HI running, and the 1 week of pp reference running. LHC performance is outstanding, the goal for the year is 75 1/fb for both ATLAS and CMS.
- A LHCb VELO incident occurred on January 10th, 2023 due to a failure of the vacuum system of the VELO. Detector modules & cooling are not damaged, but an RF foil has undergone plastic deformation. The VELO can thus not be closed and will stay in a fixed position during 2023. The impact on physics is under study. The foil will be replaced in the 2023/24 Technical Stop.
- The HL-LHC is making good progress and is on track for series production of the Nb₃Sn triplet quadrupole magnets. Several magnets have been accepted and reach nominal current plus 300 A at 1.9 K.
- The Phase-2 upgrades of the experiments see challenges, although they are moving from R&D and prototyping to (pre)production. Specific issues are Chip design and

validation and contributions from institutes in Russia (and Belarus): There is a strong recommendation from the LHCC to develop plans to become as much as possible independent of (time-)critical in-kind contributions. CMS HGICAL is the most exposed project. As a mitigation measure, a stronger engagement by all collaborators and plans for speeding up production are required.

- For ALICE and LHCb, LHCC reviews for their future upgrades have started, and discussions with funding agencies are ongoing. CERN is expecting scoping documents in early 2024 matching available resources and HL-LHC schedule.
- The HL-LHC timeline foresees 3000 1/pb to both ATLAS and CMS, and sticking to the outlined timeline is important in view of future projects like e.g. FCC.
- For the FCC, the feasibility study is ongoing; the placement of the machine in the Geneva area has been optimized, and a realistic timeline has been developed.
- Concerning neutrino physics, there are two main activities for the LBNF/DUNE project at CERN:
 - i) Validate the final prototypes of the DUNE far detectors (horizontal and vertical drift concepts). This is unfortunately still hampered by the unavailability of LAr (at reasonable costs). The aim is to close both cryostats this year.
 - ii) European contribution to the LBNF/DUNE infrastructure - CERN is building the two large cryostats for the DUNE far detectors.
- The CERN Science Gateway is nearing completion, and an inauguration event with high-level guests is scheduled for 7 October 2023. Next, the 50th (40th) anniversary of the discovery of neutral currents (W/Z bosons) will be celebrated.
- ECFA is implementing its Detector R&D roadmap, including the formation of DRDs at CERN for six different technology areas. After review, these collaborations shall start their work in 2024.
- The ECFA Study on Physics, Experiments and Detectors at a Future e+e- Factory is progressing. A second workshop will be held close to Naples in early October 2023.

India

- No report

Canada and TRIUMF (R. Teuscher, N. Smith)

- Canadian contributions comprise a large set of projects: ATLAS at LHC, Belle II, ALPHA, SNO+, DEAP-3600, SuperCDMS, T2K, ISAC and ARIEL, TUCAN, FrPNC, TRINAT, ...
- A long-range planning document was published in March 2022 with a 20 year vision. It also identifies "science impact areas", e.g. i) colliders - Higgs physics etc., ii) fundamental symmetries and observed asymmetries, iii) dark matter and potential dark sectors.
- A total of 16 recommendations was issued, including support for Research Scientist program, digital infrastructure etc.
- Canada sees large benefits to society of its research. Recently, a survey of career plans of Canadian graduates was performed that also highlights societal impacts.
- TRIUMF has recently developed its governance structure to an incorporated not-for-profit, with membership from Canadian universities.
- In summer 2022, TRIUMF has completed the 20-year vision process to define longer-term planning requirements (TRIUMF has 5-year funding cycles), including the Canadian long-range plan for sub-atomic physics.
- TRIUMF's Ariel accelerators - the Advanced Rare IsotopE Laboratory (ARIEL) - will bring intense clean RIB beams into ISAC experiments from 2027 onwards, realizing a multi-user multi-disciplinary RIB facility. 2026 first beams from the ARIEL electron target are expected.

- TRIUMF is involved in HL-LHC where it contributes to, e.g., crab cavity cryomodules and to studying the HL-LHC long range beam-beam effect and wire compensation. The lab will also, in future, contribute to EIC.
- There is increasing engagement in the nEXO double-beta decay experiment. There is CFI funding for development work in Canada; a new award is contingent on DOE investment.
- A new \$50M facility to support radio-isotope production and research into next generation medical isotopes and radio-pharmaceuticals is being built (IAMR – Institute of Advanced Medical Isotope Research).
- Geoff asks about the funding envelope. Nigel answers that for operations funding is available until March 2025. There is CFI support for many projects – it is a grant-driven approach, causing some headache because not all funding for key infrastructures could be obtained.

Russia / JINR

- No report

6. ICFA Panel reports

No detailed minutes are given – please refer to the slides in INDICO for more details.

ANA panel (C. Tang):

- There are no major changes to the panel composition. C. Tang will head the panel until next year.

Beam Dynamics panel (Y. Cai):

- The Beam Dynamics Newsletter is now published in JINST, consolidating the newsletter (that was spread around) in a peer-reviewed journal (started by I. Hoffman, the previous panel chair).
- The BDP website <https://www.icfa-bd.org> lists all events etc., and is the connection to the newsletter.
- Panel membership: well-balanced (continents, accelerator types, expertise); replaced one member in last year, need to replace two more. Need to address long-service issue (average service >11 years) and clarify and enforce renew procedure.
- Yunhai reports on many workshops and events – please refer to the slides.

Instrumentation Innovation and Development panel (M. Demarteau for I. Shipsey):

- The diversity of the panel increased recently – 5 new members added (geographic, gender) – now very strong panel
- Ian reports on the instrumentation schools and EDIT schools, and on the second year of the instrumentation award. There are also now, after ICFA approval, instrumentation studentships.
- Tatsuya asks about the accommodation of Russian and Chinese students at US-hosted schools. Marcel answers that especially at DOE labs, Russian attendance is impossible, while all material used in the school will be in the open domain. The situation is different at US universities.

DPHEP (C. Diaconu):

- A “decade report” was recent accepted by EPJ C. As a general message, DPHEP finds that there is a significant increase in science output (10% typically) for minimal investment overhead (0.1%) – DP is a cost-effective way of doing fundamental

research by using unique data sets in the light of increasing theoretical understanding.

- The next challenge at the horizon is the end of LHC running around 2040.
- Stuart asks about the collaboration – regular meetings? Cristi: not classical collaboration – but stimulating environment; there are regular meetings – one collab meeting every two years, and remote meetings, and one more meeting before ICFA seminar.

SCIC (H. Newman):

- Please refer to the slides.

Sustainability (T. Roser):

- The panel has taken up new aspects like energy recovery, and waste heat usage at laboratories.
- Tatsuya asks about sustainable workshops and on any ideas on how to overcome the time difference for hybrid participation.

7. Software Panel Discussion

Thomas presents the discussions on a future panel on “software” (as the initial working title was) or better data, workflows, software, computing, and networking. There is agreement between the various players in the field and within ICFA that a joint panel is a good idea.

A few important points are raised during the discussion:

- There might be subpanels to the panel, to address specific issues, e.g. those treated formerly in the DPHEP and SCIC panels, or others.
- The panel needs to address system-level aspects.
- ICFA will have to issue a statement on the new panel upon its approval.
- Having an award in the field(s) of the panel could be beneficial, as could be schools.
- The interfacing with existing initiatives is considered very important.
- The goal of the panel should be to identify actions that are not covered elsewhere – where can we bring together communities.
- Weaving in the FAIR principles into the mandate and work of the panel is important.
- So far, the panel activities are unfunded volunteer activities. If a comprehensive agenda is undertaken, a funding scheme might become necessary. ICFA could have a strategic role here.

In summary, Stuart points out that there is continued support to move forward. ICFA members are invited to come up with additional nominations. The discussion group that met already twice is charged to prepare a mandate to be approved by ICFA at the November in-person meeting at DESY.

8. Executive Meeting

The executive meeting is not documented in the public minutes.

The meeting was adjourned.