

Building a Global, Collaborative Accelerator Economy: Summary of the IPAC 2022 Industrial Session

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2022 North American Particle Accelerator Conference
August 6-12, 2022 / Albuquerque, NM

IPAC22 – Bangkok, June 12-17, 2022

- Finally, back to in person meeting – post COVID
- Collaborative and fertile environment between industry, university and research laboratories **crucial** for the successful development and implementation of the technologies required in the next years in exponentially growing markets such as those of particle accelerators.
- New impactful strategies to foster an **effective global accelerator ecosystem/network**

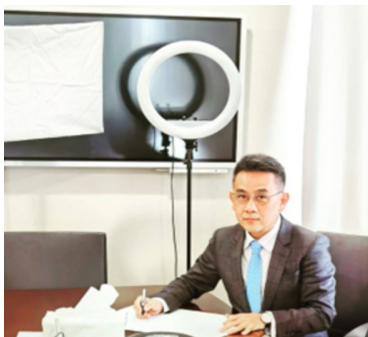
How it went...

IPAC22 – Industrial Session – aims

- Foster an effective global accelerator network / innovation ecosystem based on community, trust, openness, creativity, connection
 - Create a common language and common working ground
 - Favor exchanges in both directions
- Generate and compile novel ideas and concrete actions on how best to implement and apply strategies that would help the integration and co-innovation between industry and collaborator
- New models, new way to collaborate, new way to solve our problems

IPAC22 – Industrial Session – speakers

<https://www.ipac22.org/industry-session/>



Wiboon Rugsanchaenphol - FTI



Hans Priem – VDL ETG



Enrico Braidotti – CAENS ELS



Maurizio Vretenar - CERN



Sandra Biedron



Suzie Sheehy - University of Oxford
and University of Melbourne

BUILDING A GLOBAL COLLABORATIVE ACCELERATOR ECONOMY

Synchrotron technology - identified both as an **enabling platform** and as a **stimulator** of high precision/deep tech industry in Thailand

→ Importance of building bridges between **individuals** both in labs, university and industry

Both worlds will benefit from this integration:

- Time-to-market /speed concepts
- **Innovation** will enter the science community
- Direct social and economic impact
- Additional funding

Australia example of **disruption** ACAS Australian Collaboration for Accelerator Science relaunched with industry members as core players

I.FAST

I.FAST – Innovation Fostering in the Accelerator Science and Technology - <https://ifast-project.eu/>



- innovation-oriented program to support particle accelerator R&D launched
- launched by the European Commission in 2021
- duration of 4 years and a budget 10 M€

I.FAST proposes schemes to:

- Support **early involvement** of industry in the R&D accelerator technologies
- Profit of the experience, creativity, and **result-oriented approach** of the industrial companies

MINIATURE COMPACT ACCELERATORS

Quest for *miniature* compact accelerators

A way to “democratize” accelerators, more compact and affordable

Access to many facilities is difficult as many are oversubscribed.

- Many proposals are focusing on future, smaller facilities (UC_XFEL, CompactLight)
- Accelerator in a chip – Joel England, MOIYGD, 11PAC22
 - team funded by DOE (SLAC lab) and the Gordon and Betty Moore Foundation (NFP)
 - accelerators developed through standard semiconductor industry fabrication processes

Particle accelerators have a wide potential to expand beyond their present boundaries

- More applications accessible to accelerator
- Excellent entry points for new companies entering the field

PRESENT STATUS AND OPPORTUNITIES FOR IMPLEMENTING DISRUPTIVE TECHNOLOGIES ARISING IN PARTICLE ACCELERATOR R&D INDUSTRIAL MARKET – USA

Industry, national and federal labs, academia, government, and Not-for-Profits (e.g., user organizations, professional societies, etc.), and international organizations ALL contributes to global accelerator economy

Examples of the efforts made to grow the accelerator economy in the United States:

- Calls for proposals for funding are expected to be released annually through the new Accelerator R&D And Production (ARDAP) Office
- Accelerator Test Facility (ATF) at Brookhaven National Laboratory (BNL) - test-beds for new facilities as well as for industry
- Los Alamos Neutron Science Center - key facilities for materials science, radio-isotope production, and radiation effects testing, all critical to industry

PRESENT STATUS AND OPPORTUNITIES FOR IMPLEMENTING DISRUPTIVE TECHNOLOGIES ARISING IN PARTICLE ACCELERATOR R&D INDUSTRIAL MARKET

Further examples:

- Collaborations with the Extreme-Light Infrastructures (ELI) in Prague - Unique laser-driven ion sources for radiation therapy
- Argonne Leadership Computing Facility - synergy between accelerator, laser and computing facilities
- National Science Foundation's Center for Bright Beams – Cornell - knowledge transfer
- Link between quantum information science systems and accelerators
- Sustainability as an opportunity

**WORLDWIDE IMPORTANCE OF
A STRONG GLOBAL COLLABORATIVE ACCELERATOR ECONOMY**

IMMEDIATE ACTIONS TO ADDRESS

- Have the industry session as a **main session**, deconflict with other sessions. We need parentship across the board in general, all need to attend.
- Have an annual IPAC technology transfer and partnership **award open to nominations for industry as well as teams** (e.g., industry, labs, academia, government). Each person on the team would receive a plaque presented in the awards session. The committee would be led by an industry person with a mixture of industry, labs, academics, NFPs, and government persons.
- Have a small **workshop** as part of the conference with subject areas of discussion for sparking collaboration.
- Have **training sessions on key business activities**.
- Foster more of "**business related**" papers, posters, and talks from the industry. It is important to know a thing or two from the other side of the fence such as the business model of target industry in order to commercialize the research.

IMMEDIATE ACTIONS TO ADDRESS

- Foster the submission of **scientific papers from Industry** - there are lots of scientists working in the companies publishing in quality archival journals.
- Share documents such as model templates for IP agreements, memorandums of understanding, etc.
- A message to Industry: foster Industry aggregations/cooperation/consortia etc. which include start-up and small businesses.

➤ Promote **diversity** as a **disruption factor** not only in terms of gender and minorities but including different educational backgrounds, generations, experiences, essential for the development of new models of collaboration, innovation and business.

Diversity - The strength of starting from scratch

– A little story about **diversity** and **beginners' mind**



How take advantage from the **beginners' mind** in particle accelerators?

How make **INNOVATION** with the tools we have in-house?

Let's think about concrete actions we can do...

YOUNG PEOPLE – a treasure we have in-house!!!

Young people - The strength of starting from scratch

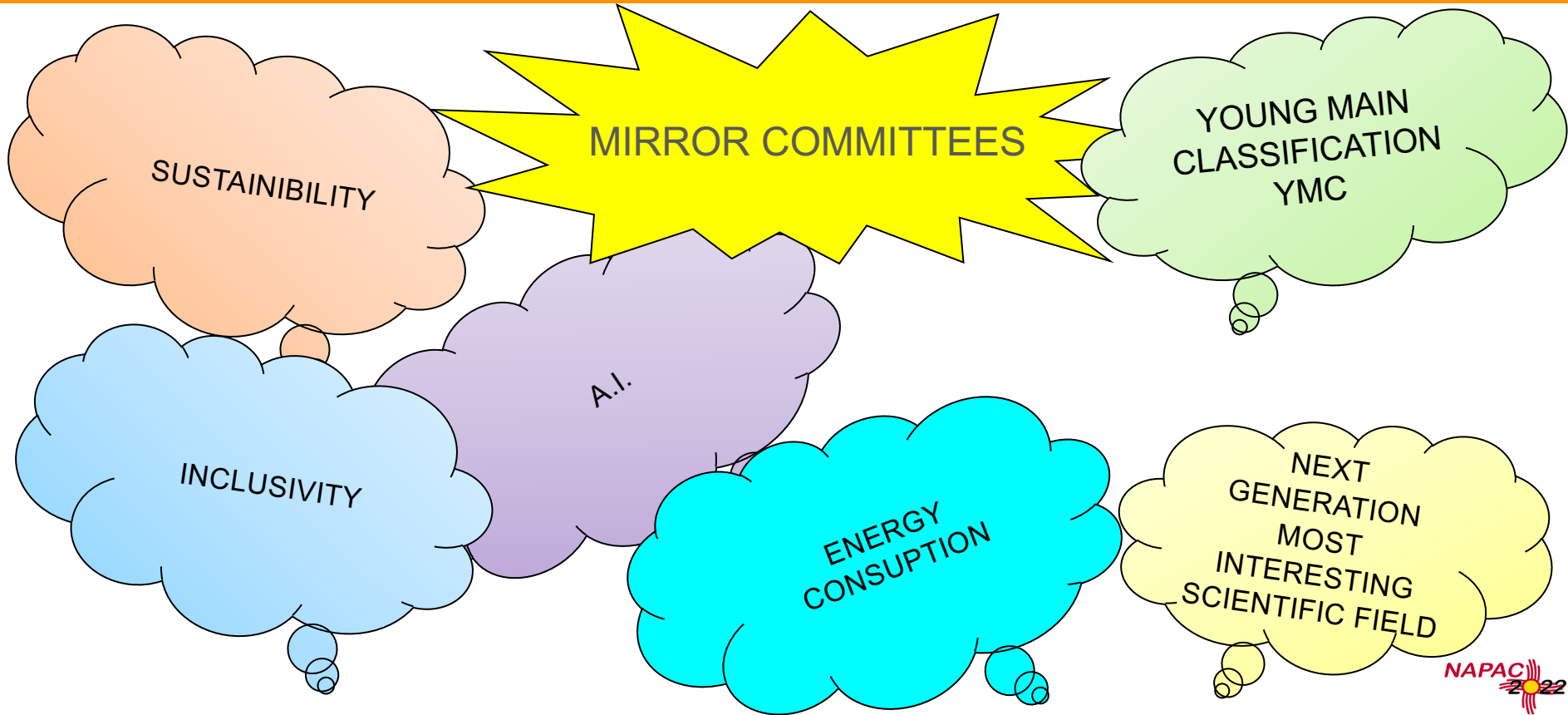
Moreover... Particle accelerators have the capability of future!

Ethics and sustainability will be the “*condicio sine qua non*” for businesses survival in the post-COVID era

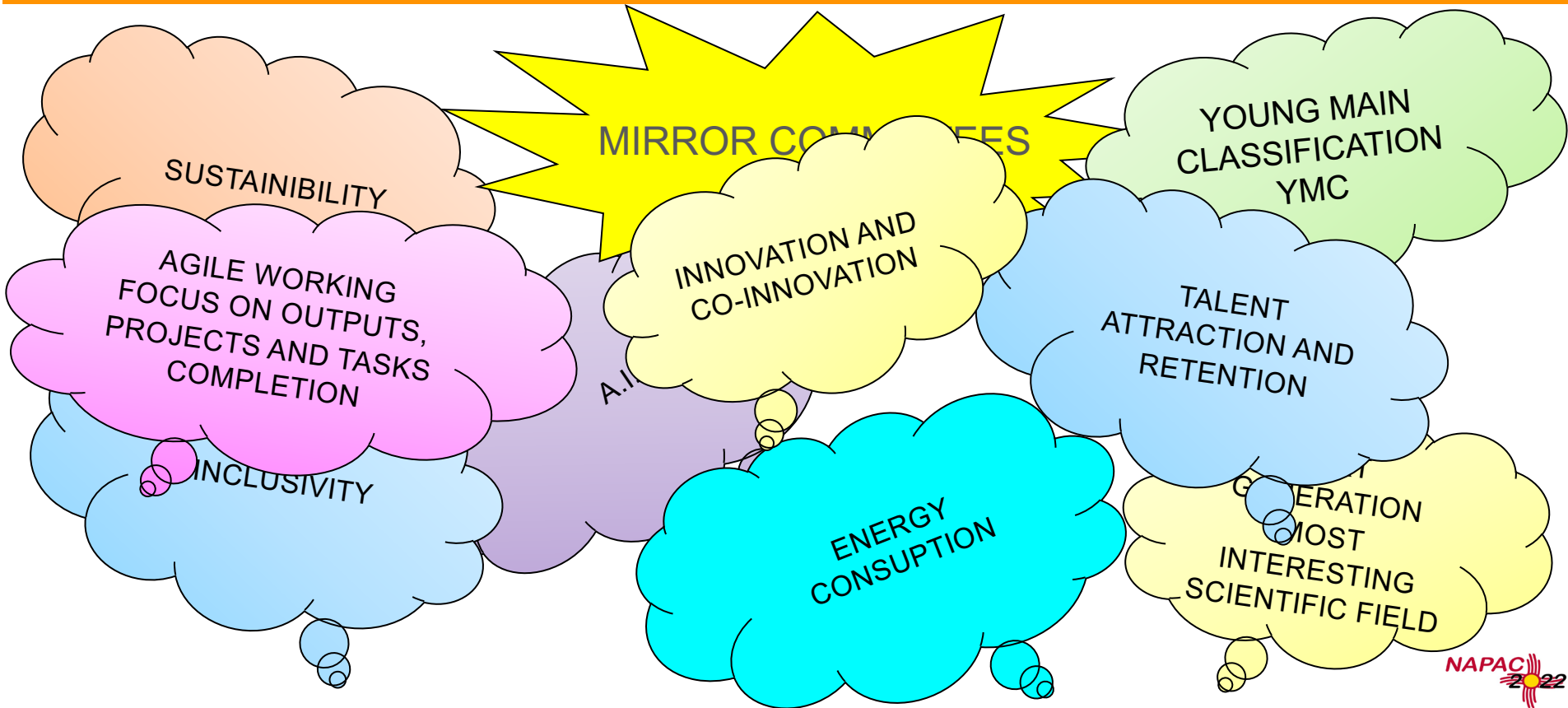
Young people have a longer horizon as they will live the future that we are imagining now

How can we give young people voice and listen to them?

Young people - The strength of starting from scratch



Young people - The strength of starting from scratch



MIRROR COMMITTEES

Diversity: gender, minority, background

Most talented young people from industry, laboratory, university

Specific strategic themes present on the traditional committees

Goal: develop projects

Isolated – no contaminations – we do not have to explain them how we do

They choose the tools and the means to discuss, elaborate and deliver their conclusions

INNOVATION with the treasures we have in-house!!

COMMON HORIZONS

COMMON VISIONS

STRONGER GLOBAL COLLABORATIVE

ACCELERATORS ECONOMY

READY TO LISTEN TO YOUR QUESTIONS!!!

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