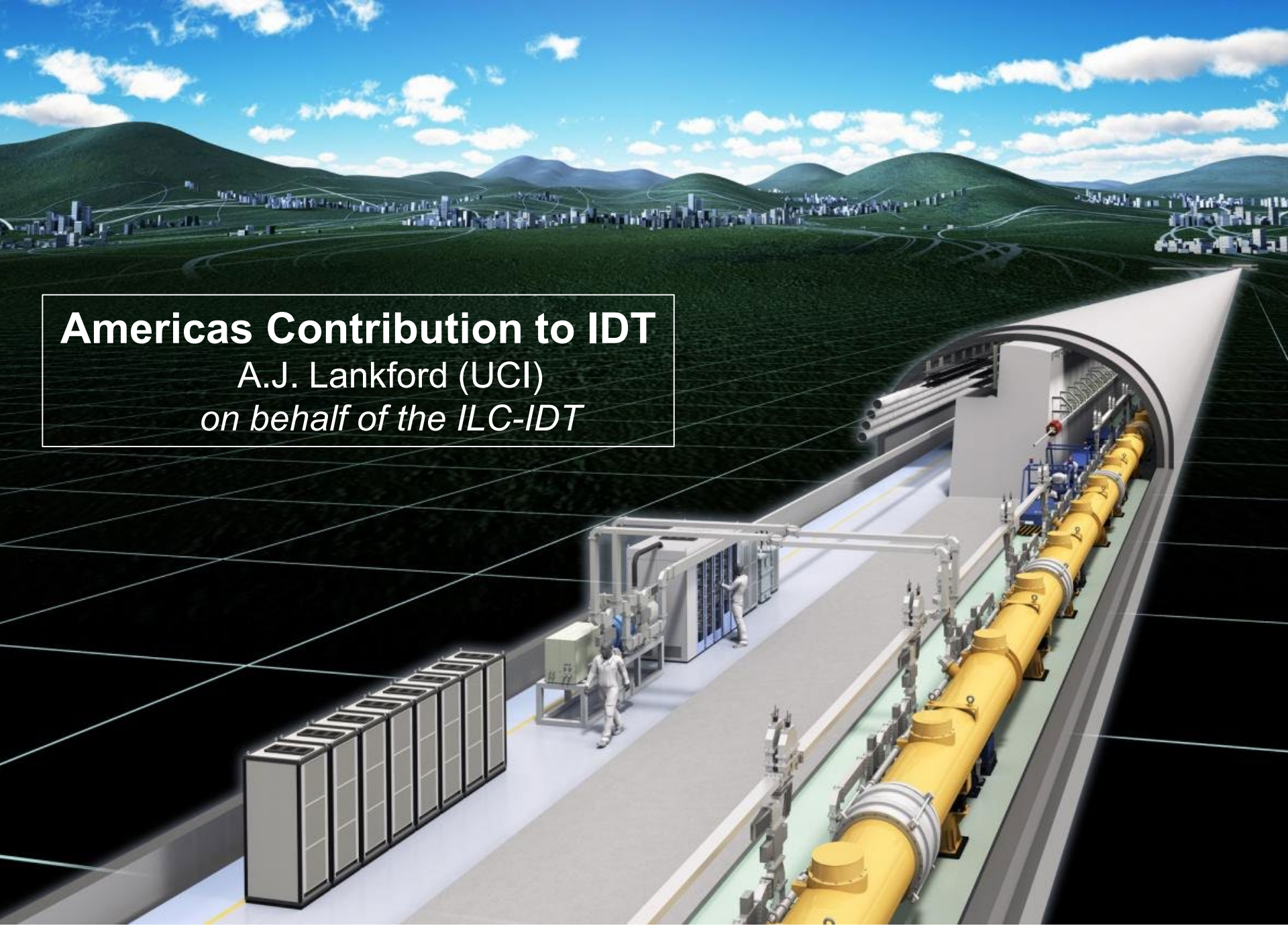

Americas Contribution to IDT

A.J. Lankford (UCI)
on behalf of the ILC-IDT

IDT organization

Scientific secretary: Tomohiko Tanabe (KEK)
Communication team lead by Rika Takahashi (KEK)

Americas' participation:

- **Americas Liaison** **Andy Lankford (UCI)**
- **Working Group 3 Chair** **Hitoshi Murayama (UCB/Tokyo)**
- **IDT Communications team, includes Leah Hesla (Fermilab)**

IDT-EB & IDT-WG1 - Pre-Lab Set-up

"The EB has the overall responsibility for the Pre-Lab preparation"

The composition of the Executive Board was shown on the previous page.

"WG1 carries out the main task of the Team, *i.e.*

working out the function and organisational structure for the Pre-Lab, as well as supporting

the preparation of Memoranda of Understanding (MoUs) among the national laboratories and other interested parties needed for the operation of the Pre-Lab, and discussions among the national authorities."

- WG1 is chaired by the EB Chair and includes the EB members.
- WG1 membership is to be established by the EB.
- WG1 membership, and role as distinct from the EB, is not yet fully defined.

The EB will receive advice from a group of selected laboratory directors from each region (or their designates).

For the Americas, the EB has invited:

- TRIUMF - to be represented by Jonathan Bagger (initially)
- Jefferson Lab - to be represented by Stuart Henderson
- Fermilab
- SLAC

IDT-WG2 - Accelerator (Chair: Shin Michizono)

- **WG2 conducts the ILC accelerator and facility work of IDT.**
- ***i.e.*, WG2 plans the accelerator activities of Pre-lab phase:**

Accelerator activities at ILC Pre-lab phase

Technical preparations /performance & cost R&D [shared across regions]

- **SRF** performance R&D, quality testing of a large number of cavities (~100), fabrication and shipping of cryomodules from North America and Europe (for validating shipping)
- **Positron source** final design and verification
- **Nanobeams (ATF3 and related):** Interaction region: beam focus, control; and Damping ring: fast kicker, feedback
- **Beam dump:** system design, beam window, cooling water circulation
- Other technical developments considered performance critical

Technical preparation

Final technical design and documentation [central project office in Japan and possibly regional project offices]

- Engineering design and documentation, WBS
- Cost confirmation/estimates, tender and purchase preparation, transport planning, mass-production planning and QA plans, schedule follow up and construction schedule preparation
- Site planning including environmental studies, CE, safety and infrastructure (see below for details)
- Review office
- Resource follow up and planning (including human resources)

Engineering Design Report (EDR)

Preparation and planning of deliverables [distributed across regions, liaising with the central project office and/or its satellites]

- Prototyping and qualification in local industries and laboratories, from SRF production lines to individual WBS items
- Local infrastructure development including preparation for the construction phase (including Hub.Lab)
- Financial follow up, planning and strategies for these activities

Planning and preparation of Hub lab.

Civil engineering, local infrastructure and site [host country assisted by selected partners]

- Engineering design including cost confirmation/estimate
- Environmental impact assessment and land access
- Specification update of the underground areas including the experimental hall
- Specification update for the surface building for technical scientific and administrative needs

Civil engineering

WG2 defines these activities for the Pre-lab phase; it does not perform these activities.

IDT-WG2 subgroups (and current American participants)

- **WG2 has 4 subgroups.**
- All WG2 members are members of subgroups, and all subgroup members are members of WG2.

- **Superconducting RF**
  - **Rongli Geng** (JLab)
  - **Matthias Liepe** (Cornell)
  - **Sam Posen** (Fermilab)
  - **Robert Rimmer** (JLab)
  - **Marc Ross** (SLAC)
  - **Bob Laxdal** (TRIUMF)
- **Damping Rings, Beam Delivery System, Dump**
  - **Tom Markiewicz** (SLAC)
  - **David Rubin** (Cornell)
  - **Nikolay Solyak** (Fermilab)
  - **Glen White** (SLAC)
- **Sources**
  - **Joe Grames** (JLab)
- **Civil engineering**

Technical preparation tasks & possible partners

Component	Issue	Summary of tasks	Candidates for collaboration w/ Japan
SRF Cavity	Mass production, incl. automation	Performance statistics, mass production technology	France, Germany, US
	Cryomodule transport	Performance assurance after transport	France, Germany, US
Positron Source	Rotating target	Exchanging target, system design	CERN, France, Germany, US + industry-academia efforts
	Magnetic focusing system	System design	France, Germany, Russia, US
	Photon dump*	System design	CERN, Germany, US
Damping Ring	Fast kicker	Test of long-term stability, system design	CERN, Italy
	Feedback	Test at SuperKEKB	Italy
Interaction Region	Beam focus/position control	Test of long-term stability	CERN, UK
Beam Dump	Total system	System design	CERN, US
	Beam window, cooling water circulation	Durability, exchangeability, earthquake-resistance	CERN, US + industry-academia efforts

From Table 4.3 of the Report of KEK International Working Group on the ILC Project

Technical preparation tasks & possible partners

Notes on table on previous page:

- **Issues in table are specific items pointed out by:**
  - **MEXT's ILC Advisory Panel**
  - **Science Council of Japan**
- **These tasks are included in KEK-ILC Action Plan.**
- **Candidates for collaboration are not based upon agreements.**
  - **They were identified by the KEK International Working Group.**
  - **Identification is based upon:**
    - ***The European ILC Preparation Plan*** (Horizon 2020 / E-Jade Report (2018))
    - **U.S.-Japan R&D collaboration**
    - **Past & recent activities on ILC and other accelerators**
  - **They are not meant to exclude other collaborators.**
- **Primary goal of technical preparation is to complete ILC250 technology.**
  - **It will also cultivate a younger generation of international scientists and engineers skilled in accelerator and beam operation technologies,**

    who can be expected to play crucial roles during ILC construction and operation.

Technical preparation tasks will be discussed in more detail in accelerator sessions.

IDT planning for technical preparation tasks

Each WG2 subgroup should:

- **Identify all remaining technical preparations and R&D**
  - **that is necessary for the start of ILC Construction,**
  - **including any items not on existing list**
- **Define in more detail the necessary technical work and deliverables,**
  - **including refinement of costs and human resource needs.**
- **Define a possible schedule for technical activities at the Pre-lab.**
- **Identify international candidates for collaboration on these activities.**
- **Report to WG2.**

WG2 should collect and refine the overall plan for technical preparations, and report to the IDT Executive Board.

IDT-EB will work out with national and regional labs a scenario for their contributions.

IDT has the (ambitious) goal of preparing the work plan in enough detail by early 2021 that laboratories (*e.g.* KEK) can request funding for 2022, which will be the first year of the Pre-lab.

WG2 will also define the preliminary Pre-lab work plan for completion of the Engineering Design Report.

Planning for Pre-lab accelerator activities in U.S.

In addition to participation in WG2 and subgroup activities,
I will invite U.S. WG2 members to participate in development of a collaborative funding proposal for Pre-lab accelerator activities in the U.S.

Goal: Strong U.S. involvement in Pre-lab activities,
which will technically enable start of ILC Construction in ~4 years,
which will signal strong U.S. support for the ILC.

I anticipate that proposal will be for 4-year directed accelerator R&D project.

Role of U.S. WG2 members, with assistance from others:

- **Understand the scope and nature of Pre-lab technical activities.**
- **Help identify tasks for which U.S. participation is critical, as well as other areas for strong U.S. participation** (incl'g. design for EDR).
- **Transform WG2 descriptions to level of detail required for a U.S. project.**
- **Estimate U.S. costs for performing prospective U.S. responsibilities.**
- **Help id a set of U.S. responsibilities that matches DOE budget guidance.**

I expect to establish an advisory body consisting of laboratory directors (or designates) to advise on development of U.S. responsibilities and proposal.

Partnering with Canada is to be investigated.
Recall that IDT is preparing Pre-lab, not ILC construction.

Planning for Pre-lab accelerator activities in U.S.

Shin Michizono will brief DOE HEP on technical activities of ILC Pre-lab next week.

- This briefing will provide HEP an overview of technical goals, costs, and human resource needs.
- It will be used as a basis for seeking initial budget guidance.

WG2 references:

- KEK-ILC Action Plan: https://www.kek.jp/en/newsroom/KEK-ILC_ActionPlan_Addendum-EN%20%281%29.pdf
- Report of KEK International Working Group on the ILC Project: https://www2.kek.jp/ilc/en/docs/Recommendations_on_ILC_Project_Implementation.pdf

IDT-WG3 - Physics & Detectors

"WG3 carries out the ILC physics and detector activities.

- **It maintains the study of the ILC physics capabilities and detector efforts currently done under the LCC framework, reflecting the on-going progress of the field.**
- **It guides the community to be ready when the ILC Pre-Lab will establish its physics programme."**

Chaired by Hitoshi Murayama
Members appointed by IDT-EB

The EB of the LCC Physics & Detectors Directorate continues now as the Executive Board of IDT-WG3.

- **Americas' members include:**
  - **Hitoshi Murayama** (UCB, Tokyo)
  - **Jim Brau** (Oregon)
  - **Dmitri Denisov** (BNL)
  - **Andy White** (UT Arlington)
  - **Michael Peskin** (SLAC)
  - **Norman Graf** (SLAC)

IDT-WG3 - Activities

Much recent focus on:

- **Snowmass Community Planning Process**
- **Some needed studies:**
  - **Broader studies in dark sector**
  - **Exotic Higgs decays**
  - **New ideas:**
    - **Experiments with ILC beams other than 4π collider detectors**
    - ***e.g.:* fixed-target, beam-dump, new detectors near IP**
  - **Future program: Physics capabilities at higher collision energies**
  - **These are all subjects upon which U.S. participation is welcome.**
- **Detector time-line** (R&D, EoI, LoI, TDR, approval, construction, etc.)
  - **Emphasis on what needs to occur during Pre-lab phase**
  - See discussion led by Frank Simon in Thursday plenary.
- **Future workshops**

More in Hitoshi Murayama's presentation in Thursday plenary session.

Closing slide

IDT activities and IDT activities in the U.S. have begun and are ramping up.

- **Executive Board**
- **WG1 - Pre-lab Setup**
- **WG2 - Accelerator**
- **WG3 - Physics & Detectors**

QUESTIONS?