



ECFA – European Committee for Future Accelerators

---

# Coordination of Detector R&D in Europe

Detector R&D Workshop, FNAL, 7–8/10/2010

Tatsuya NAKADA, ECFA Chair

Ecole Polytechnique Fédérale de Lausanne (EPFL)





- In good old days
  - Generic and relatively small scale detector R&D at universities and laboratories



- In good old days
  - Generic and relatively small scale detector R&D at universities and laboratories
  - More focused and larger detector R&D for specific experiments taking place at well defined laboratories: e.g. UA, LEP and LHC experiments at CERN, PETRA and HERA experiments at DESY. Activities were reviewed by the corresponding laboratories, e.g. DRDC at CERN for the LHC experiments

⇒ No serious funding issue



- Recent development
  - Emergence of “global” projects without a central host laboratory where the project taking place, e.g. ILC, Neutrino factories, etc.



- Recent development

- Emergence of “global” projects without a central host laboratory where the project taking place, e.g. ILC, Neutrino factories, etc.
- Scale of the detector R&D is becoming large, e.g. CALICE: Calorimeter R&D for ILC  
336 physicists/engineers from 57 institutes and 17 countries from the 4 regions (Africa, America, Asia and Europe)



- Recent development

- Emergence of “global” projects without a central host laboratory where the project taking place, e.g. ILC, Neutrino factories, etc.
- Scale of the detector R&D is becoming large, e.g. CALICE: Calorimeter R&D for ILC  
336 physicists/engineers from 57 institutes and 17 countries from the 4 regions (Africa, America, Asia and Europe)

⇒ Funding starts to be an issue  
Concerns by some national funding authorities on  
the review processes



- **Solution 1) EU funding for the detector R&D**
  - EUDET: “Detector R&D Towards the International Linear Collider”  
for EU FP6 programme,
    - Focused on ILC
    - meant to build up infrastructure for the detector R&D  
21.5 MEUR total, of which 7 MEUR from EU  
(30 institutes)
    - Network, Transnational Access, Joint Research Activities  
on simulation, pixel telescope, TPC, Calorimetry  
(CALISE)

Funding period: 2006–2009



- Continuation of EU funding I
  - DevDet: “Development of Detectors”  
for EU FP7 programme, submitted in 2008
    - Proposal coordinated by the ECFA Coordination Group for Detector R&D
    - Helped by the National Contact Group
    - 37.8 M€ total, of which 11 M€ from EU (87 institutes)
    - Targeting wider areas; i.e. CLIC, ILC, neutrinos, SLHC, flavour factories
    - Including software, irradiation facilities, test beam access, front-end electronics, etc.

⇒ Unfortunately, not accepted





- Continuation of EU funding II

- AIDA: “Development of Detectors”

- for EU FP7 programme, submitted in 2009

- Proposal coordinated by the ECFA Coordination Group for Detector R&D
    - Helped by the National Contact Group
    - 27 M€ total, of which 8 M€ from EU (70 institutes)
    - Targeting a wider area; i.e. CLIC, ILC, neutrinos, SLHC, flavour factories
    - Including software, irradiation facilities, test beam access, front-end electronics, etc.

⇒ Accepted: funding over 4 years (2011–2014)



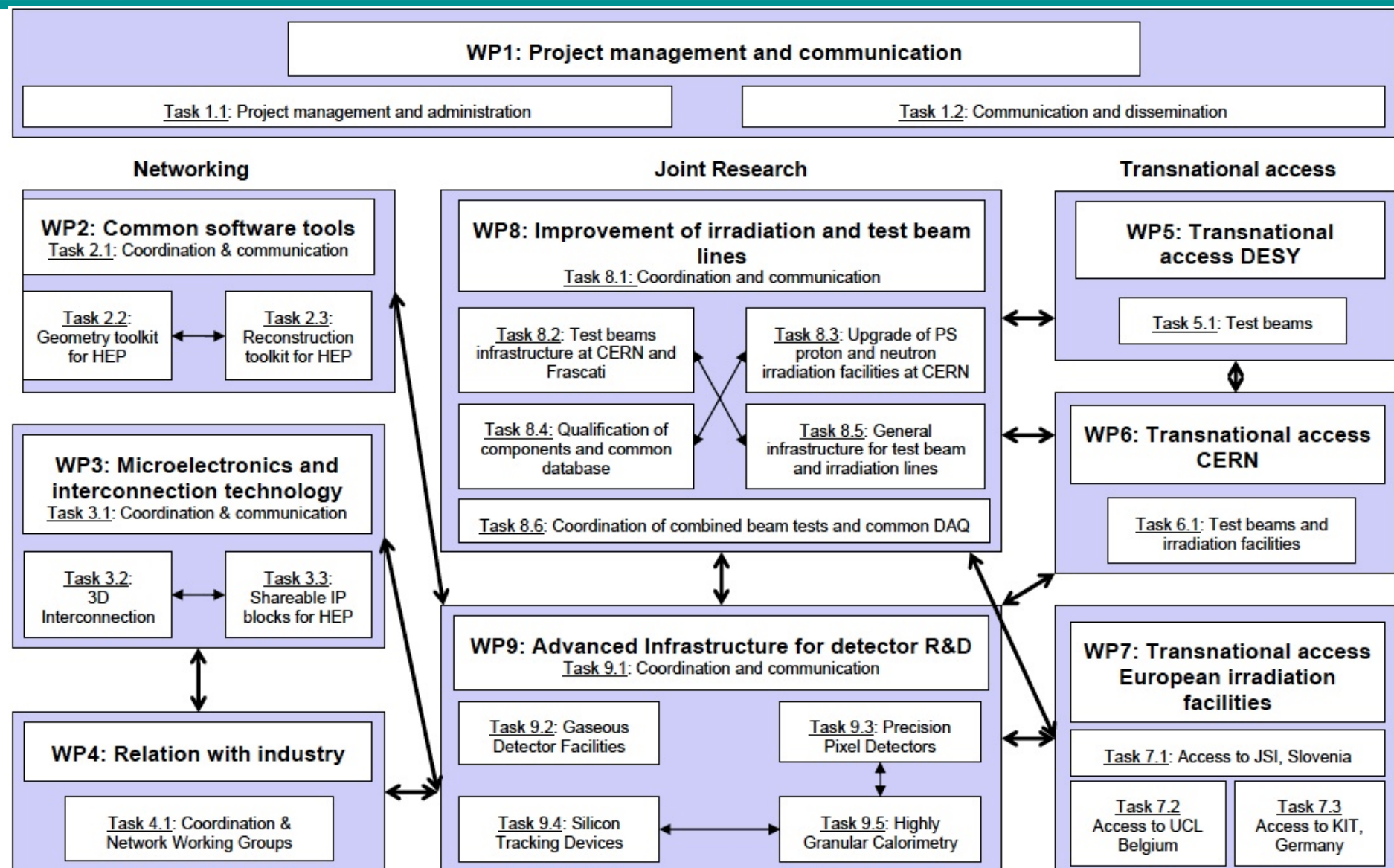
# ECFA – European Committee for Future Accelerators

- AIDA work packages

WP#	Type	Task	Description	WP Leaders
1	MGT	<b>Project management and communication</b>		L. Serin (CNRS) S. Stavrev (CERN)
		1.1 Project management and administration		
		1.2 Communication and dissemination		
2	COORD	<b>Common software tools</b>		F. Gaede (DESY) P. Mato (CERN)
		2.1 Coordination and communication		
		2.2 Geometry toolkit for HEP		
		2.3 Reconstruction toolkit for HEP		
3	COORD	<b>Microelectronics and interconnection technology</b>		H-G Moser (DESY (MPG-MPP)) V. Re (INFN-PV)
		3.1 Coordination and communication		
		3.2 3D Interconnection		
		3.3 Shareable IP blocks for HEP		
4	COORD	<b>Relation with industry</b>		S. Stapnes (CERN)
		4.1 Coordination and Network Working Groups		
5	SUPP	<b>Transnational access DESY</b>		I. Gregor (DESY)
		5.1 Test beams		
6	SUPP	<b>Transnational access CERN</b>		H. Breuker (CERN)
		6.1 Test beams and irradiation facilities		
7	SUPP	<b>Transnational access European irradiation facilities</b>		M. Mikuz (JSI)
		7.1 Access to JSI, Slovenia		
		7.2 Access to UCL, Belgium		
		7.3 Access to KIT, Germany		
8	RTD	<b>Improvement and equipment of irradiation and beam lines</b>		M. Moll (CERN)
		8.1 Coordination and communication		
		8.2 Test beams infrastructure at CERN and Frascati		
		8.3 Upgrade of PS proton and mixed-field irradiation facilities at CERN		
		8.4 Qualification of components and common database		
		8.5 General infrastructure for test beam and irradiation lines		
		8.6 Coordination of combined beam tests and common DAQ		
9	RTD	<b>Advanced Infrastructure for detector R&amp;D</b>		M. Vos (CSIC (IFIC)) V. Boudry (CNRS (IN2P3)) H. Videau (CNRS)
		9.1 Coordination and communication		
		9.2 Gaseous Detector Facilities		
		9.3 Precision Pixel Detectors		
		9.4 Silicon Tracking Devices		
		9.5 Highly Granular Calorimetry		

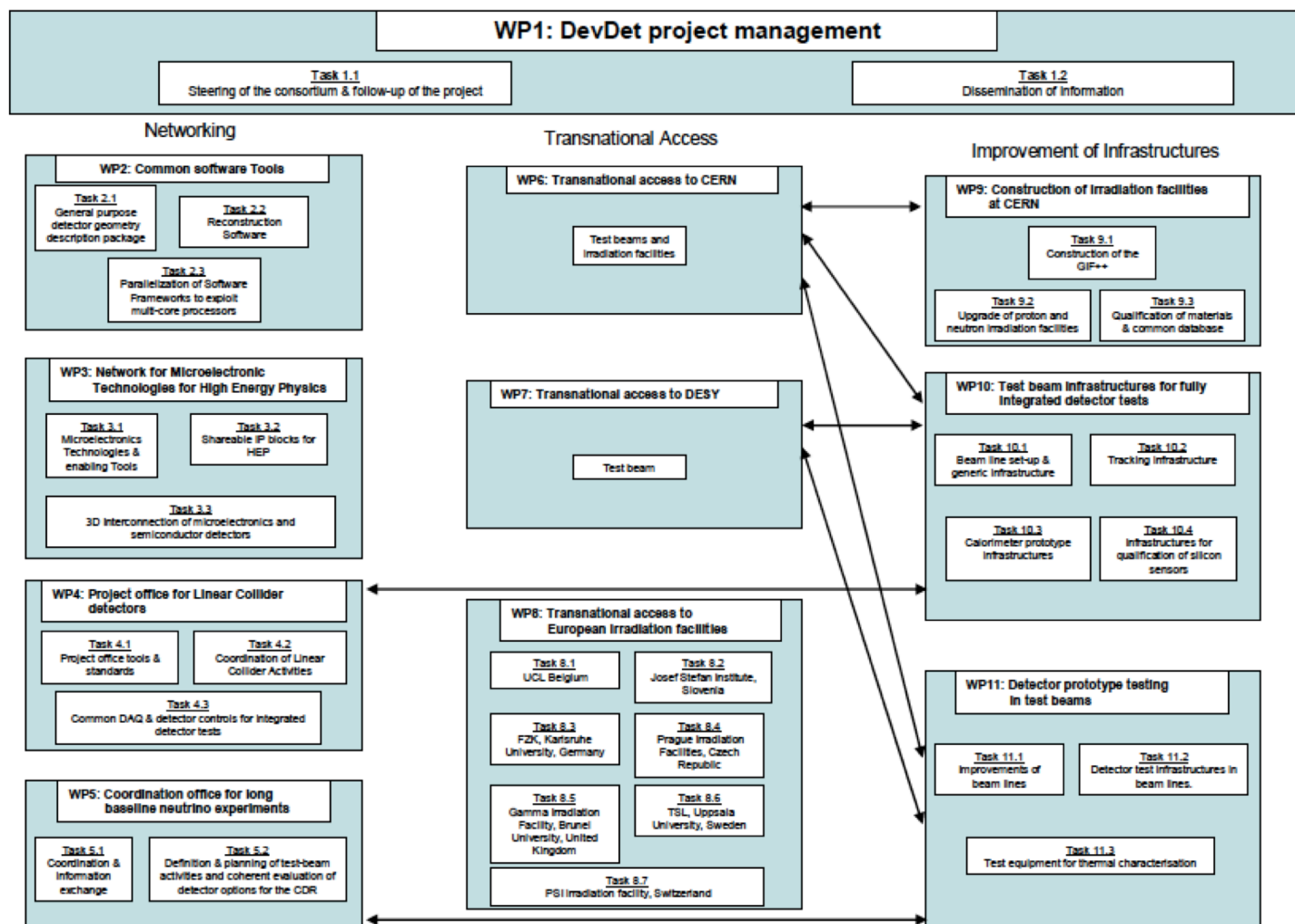


# ECFA – European Committee for Future Accelerators



- Not to much different from...

Diagram of DevDet work packages





- What are the pro and contra?
  - ☺ Extra funding outside of usual particle physics funding





- What are the pro and contra?
  - ☺ Extra funding outside of usual particle physics funding
  - ☹ Selection is somewhat unpredictable for our community → professional advice for the proposal?
  - ☹ Heavy administrative work before and after → after can be included in the funding request



- What are the pro and contra?
  - ☺ Extra funding outside of usual particle physics funding
  - ☹ Selection is somewhat unpredictable for our community → professional advice for the proposal?
  - ☹ Heavy administrative work before and after → after can be included in the funding request
  - ☹ It is meant to be for infrastructure and not for the actual R&D
  - ☹ EU review process, decoupled to the rest of the particle physics community



- **Solution 2) Peer review by a laboratory**
  - Some ILC detector R&D groups asked DESY Physics Review Committee to review their projects although they are not projects at DESY, since DESY is heavily involved in ILC: e.g.
    - Calorimetry  
CALICE, LCCAL, FCAL
    - Tracking  
SILC, TPC, GEM/Micromegas/Silicon pixels
    - Vertex detector  
LCFI, DEPFET, MAPS





- What are the pro and contra?
  - ☺ It provides peer review connected to the particle physics community



- What are the pro and contra?
  - ☺ It provides peer review connected to the particle physics community
  - ☹ It does not provide a global solution, since there are more projects, such as CLIC, neutrinos, etc.
  - ☹ For some country's funding agencies, true "European" flavour is missing.



## ECFA – European Committee for Future Accelerators

---

- How ECFA can help?



- How ECFA can help?

### ECFA review panel for European detector R&D

- Review European detector R&D efforts for orphan accelerator based particle physics projects
  - LC's, neutrino, B factories, etc.–

(possibly also the AIDA midterm report?)

to help funding, by providing peer reviews in a European level, and efficient use of resources.



- **ECFA Detector R&D Panel**

- A reviewing and advisory role, not for coordination of the R&D programs.
- For large R&D involving many laboratories and significant resources.
- Report to ECFA and the ECFA chair informs the European session of the CERN council.
- R&Ds related to accelerator experiments.  
May expand its field of expertise to R&Ds on non accelerator particle physics detectors, if requested.
- Panel's reports become available to the public including funding agencies.
- The chair and members nominated by RECFA. Hosted and operated by a European laboratory.



- **ECFA Detector R&D Panel**

- Its principle has been accepted by the Plenary session of ECFA
- Restricted session of ECFA is working on the implementation plan. Hope to start in early 2011.
- Although it is European panel, we wish the panel members to be international.
- Contribute to the distributed roles of European laboratories in the landscape of European Strategy and global projects.



- ECFA in four transparencies



- ECFA in four transparencies (I)
  - Started in early 1963 (!)
  - ECFA is not in the CERN structure but a community organization, although receives some secretariat help from CERN and works closely.
  - Represented in different European and international bodies, e.g.
    - CERN: SPC, FC and Council meetings
    - DESY: Scientific Council meetings
    - APPEC: Steering meeting
    - EPS: HEPP board meeting
    - ICFA and ILCSC





- ECFA in four transparencies (II)
  - Membership: CERN member states (including CERN) and some observer states
  - Restricted meeting of ECFA (RECFA): (5/year)
    - one delegate per country (observer states: Israel and Russia only),
    - CERN: DG, Director of Research and Coordinator for External Relations,
    - DESY: Director for HEP and astroparticle physics
    - Frascati: Director
  - Plenary meeting of ECFA (PECFA) (2/year)
    - more people per membership countries



- ECFA in four transparencies (III)
  - ECFA members are nominated by the each member countries and endorsed by the ECFA Plenary meeting
  - Chair of ECFA is nominated by RECFA and endorsed by PECFA



- ECFA in four transparencies (IV)
  - Monitor the development of particle physics activities in the member countries:
    - Regular RECFA visit to the member countries (3/year)
    - Regular survey by RECFA on the particle activities in the member states (1/several years)
  - Help the development of new European initiatives in particle physics
    - morally sponsoring workshops
    - setting up working groups & panels for specific subjects
  - All the issues are presented for discussion in the plenary meetings