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# ILC Options for FP7

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DESY

# ILC as the strategic role for HEP in Europe

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- after commissioning of LHC the ILC has been identified as the next large international project of HEP
  - EPP 2010  
"highest risk-adjusted return"
  - ECFA  
endorsement
  - OECD  
ministerial statement
  - CERN Strategy Group (not yet published)  
places a high weight in the participation of Europe including CERN in the ILC in the framework of the GDE



# European Obligation

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- with the successful development of SC RF technology to the status of a viable accelerator technology
- with the overwhelming conclusion of the ITRP in August 2004 to select the SC RF as the technology for the ILC
- with the rapid developments in the GDE
- the successes of CARE JRA SRF and EUROTeV and the strong recognition of the ILC endeavour at the European Commission

European HEP is obliged to contribute to the ILC and its Research & Development in the strongest possible manner while respecting the constraints of the ongoing LHC commissioning programme. The EC is prepared to contribute to this research in a significant manner.

# Elements of a European ILC Programme

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- SC RF cavities need to be advanced to a state
  - that guarantee a high gradient
  - that makes the production affordable

The core of the European FP 7 programme must be centred around the programme where

- Europe has the lead
- Europe commands respectable infrastructure
  - XFEL
  - infrastructure at CERN (requires refurbishment)

such that the impact to the project is guaranteed to leave a significant impact for European science irrespective of the chosen location of the facility.

# Letter to the Strategy Group

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15 March 2006

## **Letter of Intent about a European SC RF Facility**

To: CERN Council Strategic Planning Group

From: European partners of the TESLA Technology Collaboration and other interested institutions

Subject: European Super-Conducting RF Facility

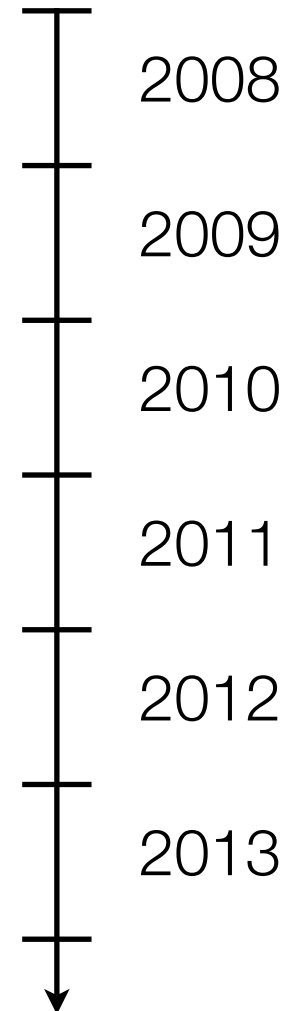
The European partners of the TESLA Technology Collaboration and other interested institutions intend to propose a new European SCRF facility to be built and operated in the EU 7<sup>th</sup> Framework Program (FP7) by a collaboration of all interested European laboratories and institutes. This facility would permit to build and test high performance SCRF structures and to integrate them into modules.

# Period 2007-2013

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- Post-RDR
  - reference design will have been established
- TDR-contributions
  - optimisation of designs
  - site specific activities
    - in Europe
    - outside of Europe
  - site specific layout
- Prototyping and pre-construction work



# Ongoing EC funded Activities

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- CARE (Integrated Infrastructure Initiative) (2004-2007/8)
  - SRF (Joint Research Activity)
  - ELAN (Network)
- EUROTeV (Design Study) (2005-2007)
  - 7 Work Packages
- EUDET (Integrated Infrastructure Initiative) (2006-2009)
  - Test beam infrastructure
  - Tracking
  - Calorimeters
  - Network
  - Transnational access

} Will assume that detector research has been taken care of. No need for immediate action – wait till 2008.

# Other Activities (not necessarily EC funded)

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- Beam Delivery
  - Crab Cavity
  - IR layout (crossing angle specific)
- FLASH (alias TTF / VUV-FEL)
  - Beam / instrumentation experiments
- PETRA III
  - Laserwire experiments (partially EC funded)
  - Emittance/wiggler studies
- ATF
  - Final focus



# Positron Source

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- Undulator development (CCLRC, Cornell, DESY, Liverpool, LLNL, SLAC)
  - Design and further prototyping of 150 m undulator.
  - Target construction
  - Spin transport depending on final IR layout
- Layout / cost optimisation

# Damping Rings



- Verification of design

- vacuum chamber design verification

- damping ring layout using existing facilities (site specific)

- Commissioning

- proven strategies

	ATF2	PEP II	CESR	LHC	HERA
e-cloud					
fast ion					
emittance					
kicker					
instrumentation					

# Diagnostics

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- Feedback systems
- Laserwire
- BPM readout / verification
- IR specific diagnostics
  - fast luminosity determination, energy spectrometer and polarimetry (LEP)

# Simulations

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- continuation of ongoing activities as specifications change
  - BBSIM
- failure modes assessment
  
- (Some EUROTeV participants wish to continue specific research beyond ILC)
  - drive beam for CLIC

# Stabilisation

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- site measurements complete (or easily done)
- development of specific hardware
  - quads in cold mass
  - final doublet
  - ...

# Remote Control / Control Systems

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- GAN / MVL will have considerable achievements
- New control systems planned for LHC, XFEL, ...
  - joint proposal?
- Exploring/advancing ATCA based systems
  - initiatives in the US

# Partitioning the Programs



- relevant to
  - timing
  - partners
  - facilities
  - interregional context
    - R&D in US and Japan



# Activities in FP7

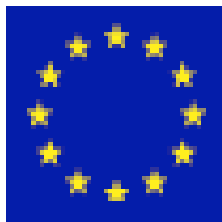
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- For new research infrastructures (incl. major upgrades)
  - Design Studies
  - Construction of New Infrastructures

} probably first
- For existing research infrastructures
  - Transnational Access
  - Integrating Activities
  - ICT based e-infrastructures

} 2<sup>nd</sup> round



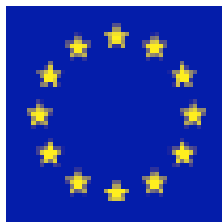


# Existing Research infrastructures

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- Objective: To optimise their use, development and integration
  - Transnational Access: to support new opportunities for research teams to obtain access to the best research infrastructures
  - Integrating Activities: to integrate European infrastructures and promote their coherent use and development (networking + transnational access + joint research activities)
  - ICT based e-infrastructures: to foster development of high-capacity and high-performance communication (GÉANT) and grid infrastructures
- Implementation : bottom-up calls for proposals open to all fields of
- science + targeted calls in close co-operation thematic areas in FP7



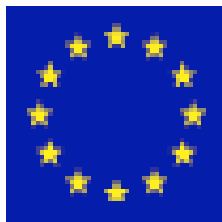
# New research infrastructures in FP7

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- Objective: To help create new research infrastructures of pan-European interest (or major upgrades of existing ones)
  - Design studies: to support feasibility studies for new infrastructures through approach of calls for proposals
  - Construction of new infrastructures (incl. major upgrades): to promote the creation of new infrastructures through a strategic approach based on the work conducted by ESFRI\* on the development of a European roadmap for new research infrastructures

\* ESFRI – European Strategy Forum for Research Infrastructures

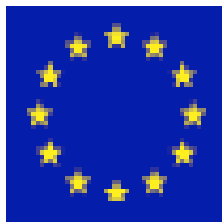


# New research infrastructures in FP7

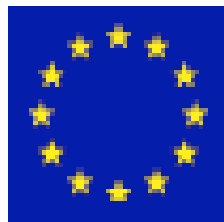
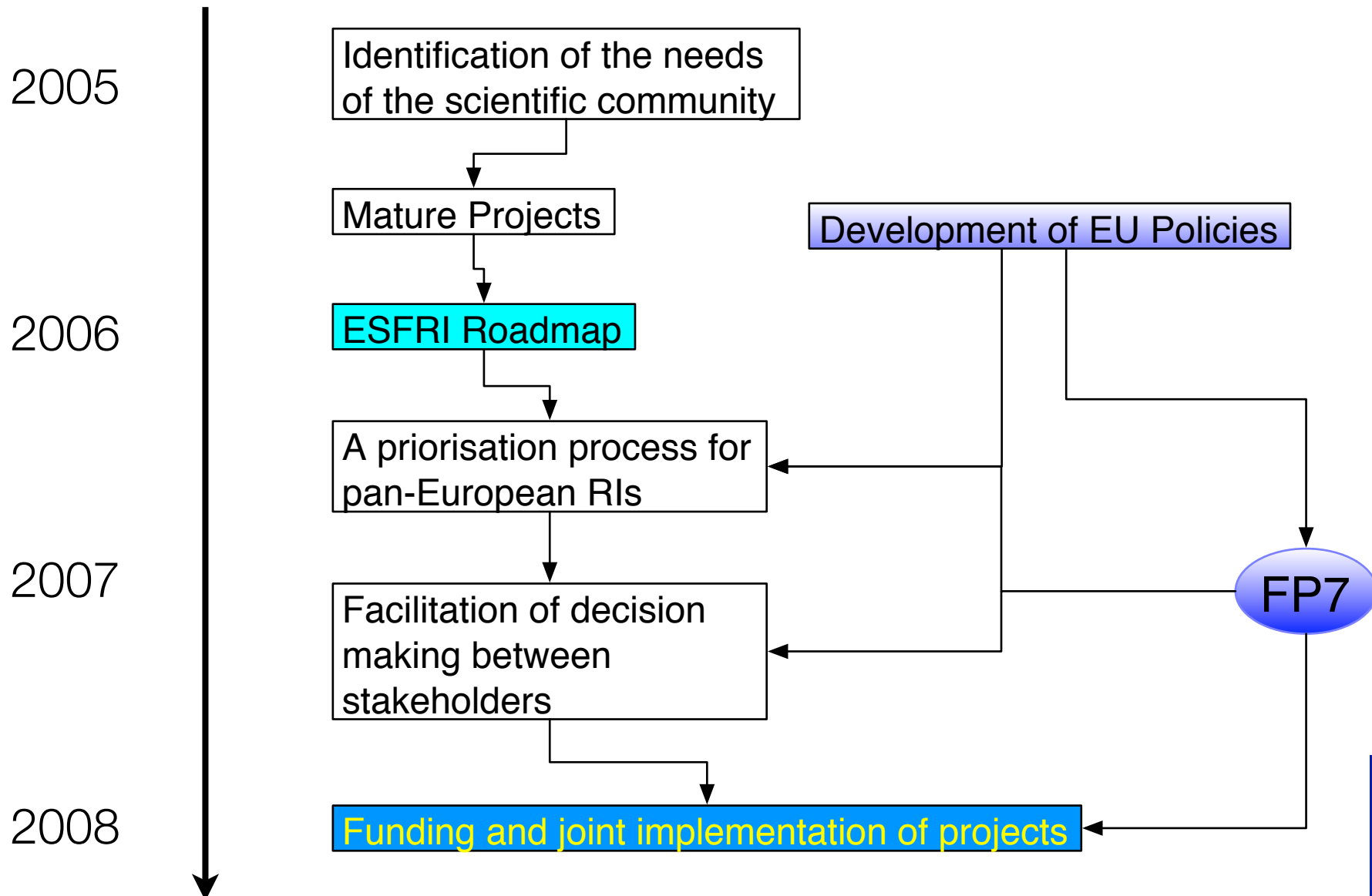
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- Construction via a two-stage process:
  - The preparatory phase
    - restricted calls targeting priority projects (based on the work of ESFRI) to support finalisation of construction plans, legal organisation, financial engineering, management aspects
  - The construction phase
    - developed following the satisfactory implementation of the preparatory phase
    - “case by case” approach (e.g. use of Article 171)



# The ESFRI Roadmap and FP7



# Conclusions

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- SC RF infrastructure
  - assume recommendation of ESFRI
    - possibly preceded by a Design Study
  - could accommodate other topics
- Other research related
  - I3, i.e. peer review
  - HERA Damping ring would help in many respects...