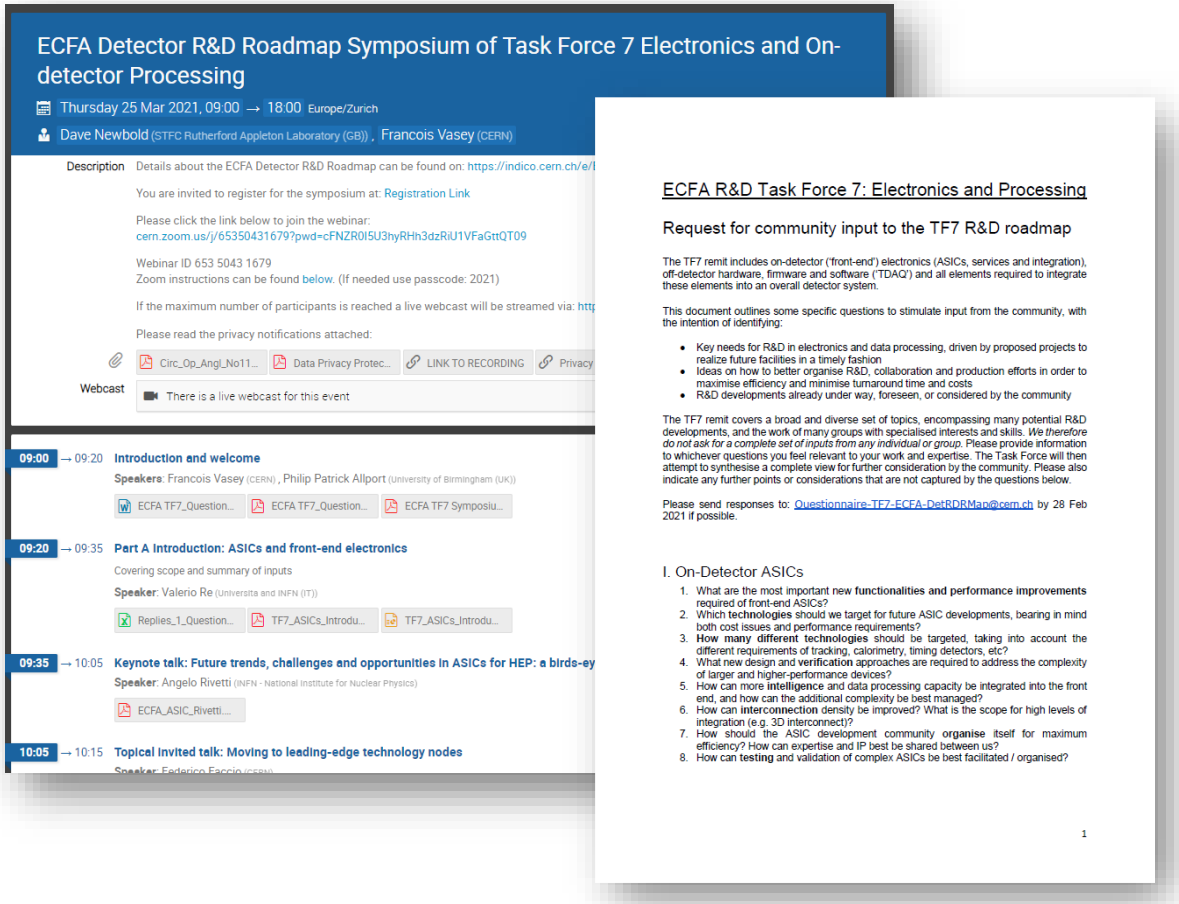
Science and Technology Facilities Council

UK Electronics & Integration Workshop

ECFA TF7 Report

Rob Halsall

ECFA TF7



https://indico.cern.ch/event/1001692/

- Questionnaire
- 1 day workshop
- 15 Presentations

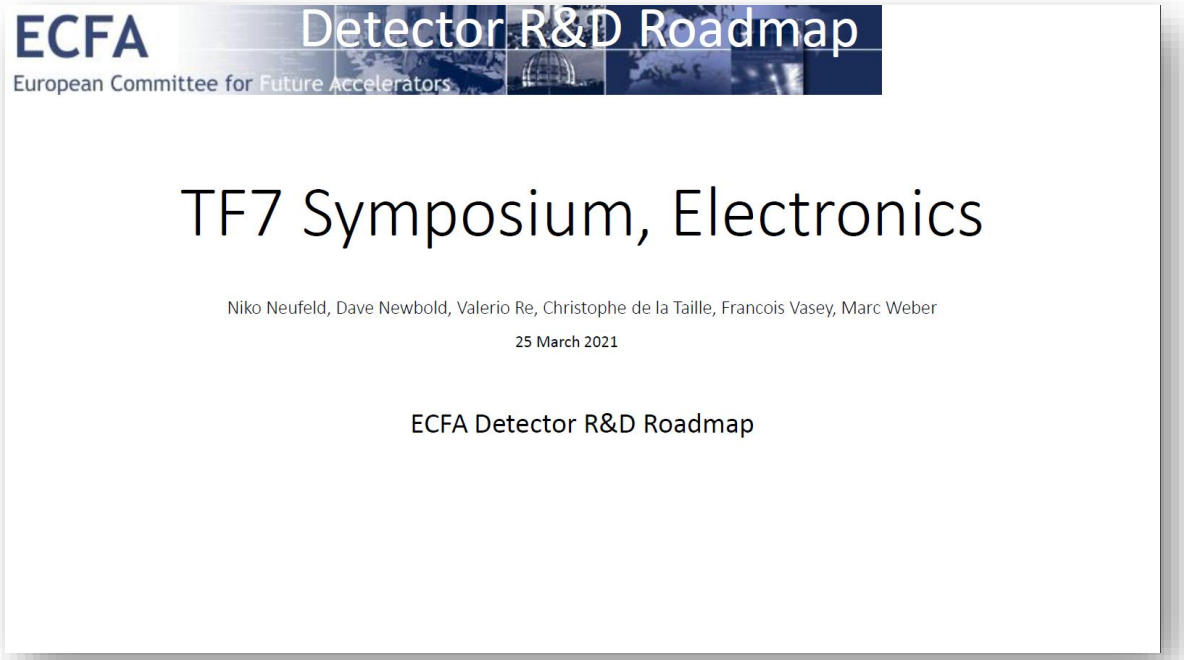
- ASICs & Front End Electronics
- Links Powering & Interconnects
- Off Detector Systems

- All talks/videos/Q&A/Survey Response/Wrap up on line

ECFA TF7 Overview

	Introduction and welcome	Francois Vasey
A	**ASICs and front-end electronics**	**Valerio Re**
	Future trends, challenges and opportunities in ASICs for HEP	Angelo Rivetti
	Moving to leading-edge technology nodes	Federico Faccio
	3D integration	Christophe Wyon
	Perspectives on future development	Erik Heijne
	Comments and brief discussion	Christophe De La Taille
B	**Links powering and interconnects**	**Marc Weber**
	Front-End Power and Links - Trends and Expected Needs	Philippe Farthouat
	Future rad-hard optical links	Jan Troska
	Wireless link technologies on the detector	Richard Brenner
	Powering and data communications challenges at FCChh	Werner Riegler
	Comments and brief discussion	Francois Vasey
C	**Off-detector systems**	**Niko Neufeld**
	DAQ and Trigger Beyond HL-LHC	Dr Emilio Meschi
	Challenges of large software-oriented TDAQ systems	Dr Alessandro Thea
	Using COTS processing technologies effectively	Conor Fitzpatrick
	Moving intelligence onto the detector	Farah Fahim
	Comments and brief discussion	Dave Newbold
	Wrap-up and next steps	Dave Newbold

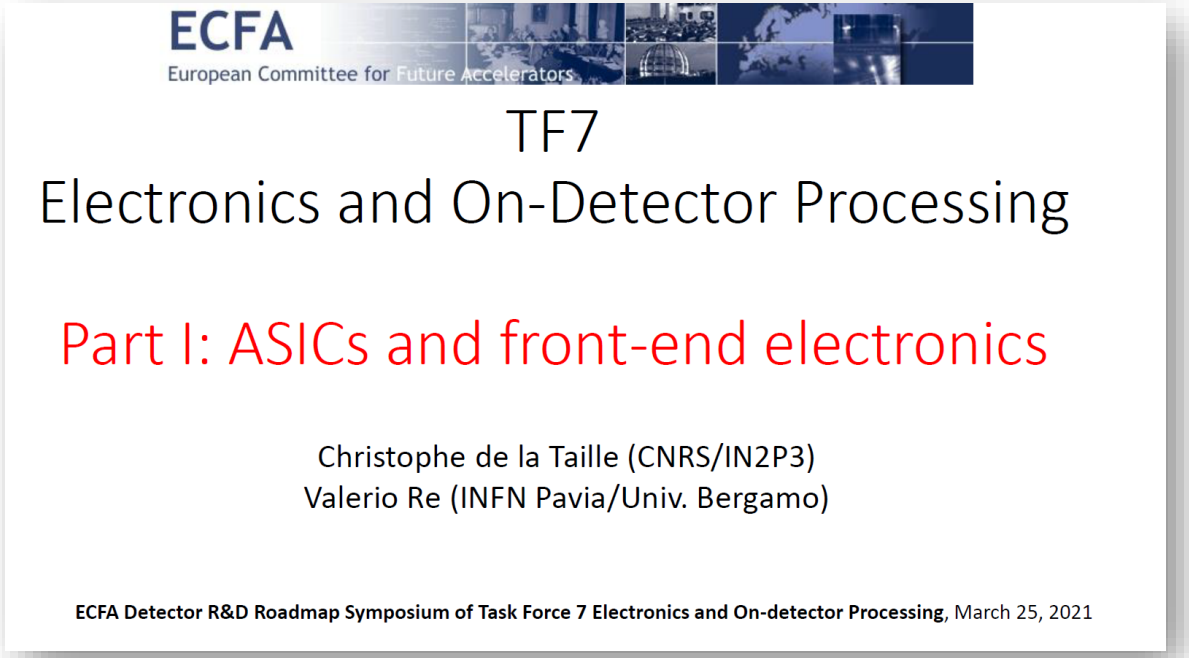
Introduction



- Results of the Questionnaire
- 23 responses
- Many at the national level
- ‘Few Predictions’

- “No UK National Response”

ASICs & Front End Electronics



A	ASICs and front-end electronics	Valerio Re
	Future trends, challenges and opportunities in ASICs for HEP	Angelo Rivetti
	Moving to leading-edge technology nodes	Federico Faccio
	3D integration	Christophe Wyon
	Perspectives on future development	Erik Heijne
	Comments and brief discussion	Christophe De La Taille

- Cost & complexity of following Industry down low nm path
- 3D IC & Silicon photonics
- Multi gigabit links
- System Architecture
- Methodology & Management
- Recruitment, Retention & Retirement
- Rad Hardness
- Building & retaining design teams long term
- Industrial Collaboration

Links powering and interconnects

B		
	Front-End Power and Links - Trends and Expected Needs	Philippe Farthouat
	Future rad-hard optical links	Jan Troska
	Wireless link technologies on the detector	Richard Brenner
	Powering and data communications challenges at FCChh	Werner Riegler
	Comments and brief discussion	Francois Vasey

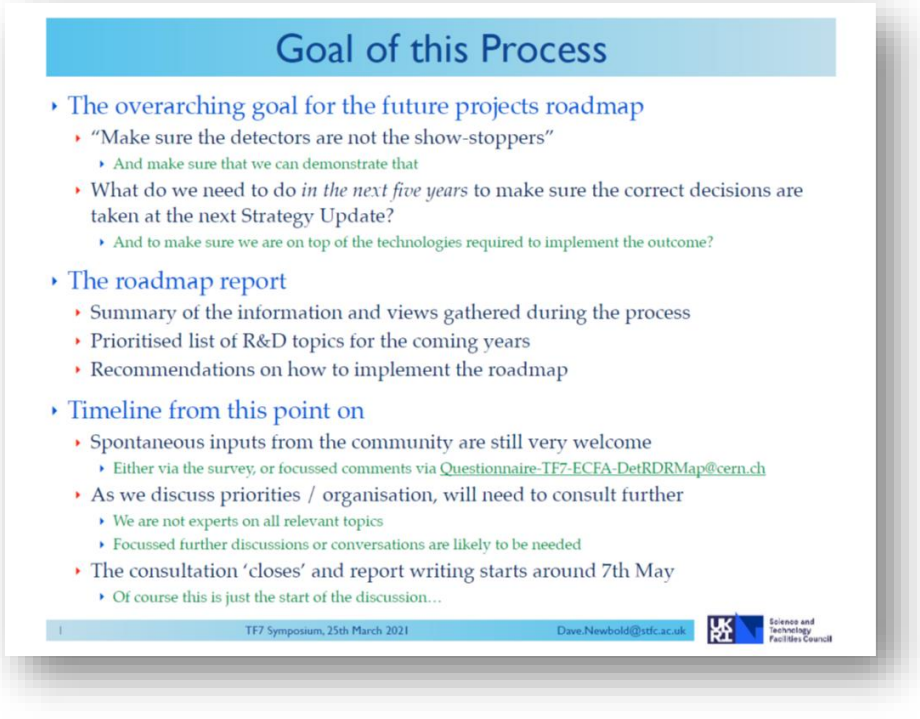
- Channels & bandwidth growth
- Optical Links - Can we keep up?
- 3D IC & Silicon photonics
- 256Gbit/s line rates?
- Direct attach to COTS networks?
- Trigger less v on detector reduction
- Powering
- Low voltage - high amps
- Rad Hard
- Magnetic field

Off Detector Systems

Off-detector systems	Niko Neufeld
DAQ and Trigger Beyond HL-LHC	Dr Emilio Meschi
Challenges of large software-oriented TDAQ systems	Dr Alessandro Thea
Using COTS processing technologies effectively	Conor Fitzpatrick
Moving intelligence onto the detector	Farah Fahim
Comments and brief discussion	Dave Newbold

- FPGA at the Front End challenges
- Non FPGA processing
- Processing on/near detector
- 3000TB/s -> Data Centre
- FPGA/PCB Complexity
- Methodology & Management
- Standard Protocols
- COTS & Industry
- Design Re-use
- Power & cooling
- Radiation Tolerant

Conclusions



	Wrap-up and next steps	Dave Newbold

- Giant Challenges
- Overwhelming number of topics
- Management & Efficiency concerns
- Careers, training & engagement
- More and more complex technologies
- Not drivers for industry
- Opportunities for more co-operation
- Opportunities for Novel Solutions
- Broad Agreement on issues
- "The problem is choice …"

Science and Technology Facilities Council

Thank you

Facebook: Science and Technology Facilities Council

Twitter:@STFC_matters

YouTube: Science and Technology Facilities Council