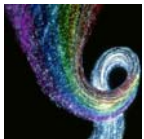




# ICT WP2011-2012 Call 7 and Call 8:

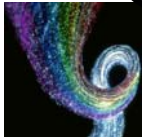
## Objective 3.5: Core and Disruptive Photonic Technologies

### DG INFSO Photonics Unit Ronan Burgess



# Overview

- **Running Biophotonics projects**
- **Budget evolution**
- **Overview of objective 3.5 in call 7**
- **Overview of objective 3.5 in call 8**
- **Wrap-up**

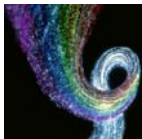




# Overview

## EU funded Biophotonics projects

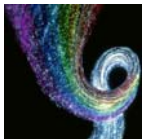
- 8 running projects from Call 2, Call 4 and Call 5
- EU funding for these projects varies between €2 million and €4 million.
- The total EU funding for these 8 projects is €23 million.



# Overview

## EU funded Biophotonics projects

- **RAPID** - Robust, affordable photonic crystal sensors for point-of-care disease diagnostics
- **P3SENS** - Polymer Photonic multiparametric biochemical SENSor for Point of care diagnostics
- **MIRSURG** - Mid-Infrared Solid-State Laser Systems for Minimally Invasive Surgery
- **INTOPSENS** - A highly integrated optical sensor for point of care label free identification of pathogenic bacteria strains and their antibiotic resistance
- **SPADnet** - Fully Networked, Digital Components for Photon-starved Biomedical Imaging Systems
- **SPEDOC** - Surface Plasmon early Detection and Treatment Follow -up of Circulating Heat Shock Proteins and Tumor Cells.
- **PHOTO-FET** - Integrated Photonic Field-Effect Technology for bio-sensing functional components
- **Photonics4Life** – Network of excellence addressing new photonic technologies for the analysis of cell processes, diagnosis and therapy, Point-of-care diagnostics, Optical micromanipulation and therapy.



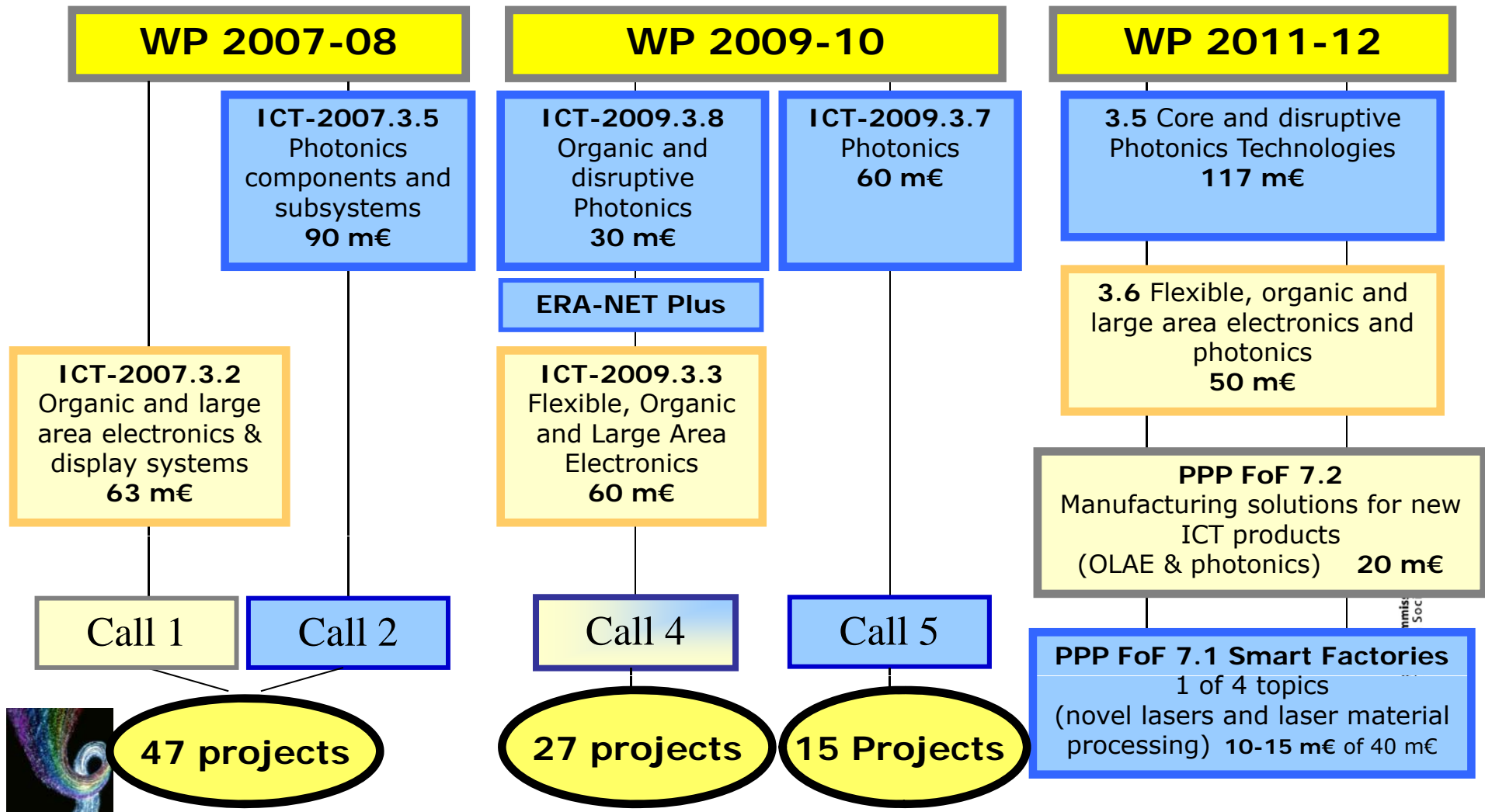
# Overview

- Running Biophotonics projects
- Budget evolution
- Overview of objective 3.5 in call 7
- Overview of objective 3.5 in call 8
- Wrap-up



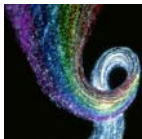


# Photonics and Large Area & Organic Electronics: FP7 budget evolution



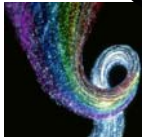
# Overview Calls

- Call 7, close 18 Jan 2011
  - Disruptive Photonics
  - Organic Electronics and Photonics
- Call 8, close 17 Jan 2012
  - Photonics
- EN+ Biophotonics, end 2012



# Overview

- Running Biophotonics projects
- Budget evolution
- Overview of objective 3.5 in call 7
- Overview of objective 3.5 in call 8
- Wrap-up





# ICT WP 2011-12

## Challenge 3: Alternative Paths to Components and Systems Objective 3.5 "Core and Disruptive Photonic Technologies"

117 M€

### a) Core photonic technologies

#### Application-specific photonic components & subsystems for:

1. Optical data communications
2. Biophotonics for early, fast and reliable medical diagnosis of diseases
3. Imaging & sensing for safety and security
4. Lighting and displays

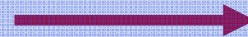
#### Cross-cutting technology:

5. Photonics integration platforms

IP

Call 8, 2011  
IP + STREP

### b) Disruptive photonic technologies



Call 7, 2010, STREP

### c) ERANET-Plus action



Call 8, 2011, EN+

### d) Pre-Commercial Procurement action



Call 8, 2011, PCP

### e) Coordination and Support actions



Call 7, 2010, CSA

including ERA-NET action



## Objective 3.5 "Core and Disruptive Photonic Technologies"

### b) Disruptive Photonic Technologies

*Call 7, opens 28 Sept 2010, closes 18 Jan 2011, 20 M€*

#### Disruptive photonic technologies

- ... are technologies at the proof-of-principle stage that offer a potential break-through in functionality, performance, component size or cost
- ... often exploit effects at the limits of light-matter interaction (e.g. plasmonics, nano-photonics, photonic crystals, ...) or new materials

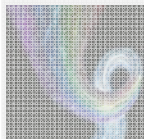
#### ■ Purpose

- Bring them from the research lab closer to applications
- Demonstrate their industrial potential through a functional component
- Involve industrial players

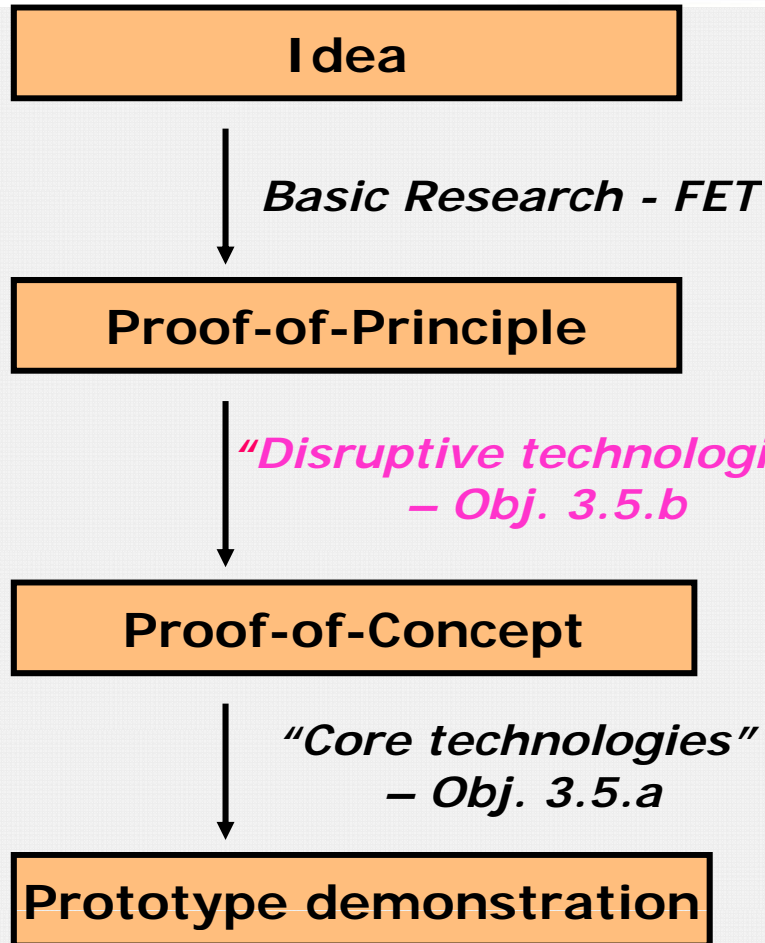
#### ■ Expected impact

- Longer-term potential for industrial leadership or societal benefits
- Opportunities for new applications

**Only STREP**



# Objective 3.5 “Core and Disruptive Photonic Technologies” “Core” vs. “Disruptive” Technologies

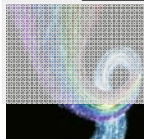


## *3.5.b “Disruptive technologies”:*

- No restriction to particular applications / technologies

## *3.5.a “Core technologies”:*

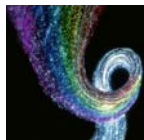
- Focussed on pre-selected applications / technologies where Europe is strong





## Objective 3.5 “Core and Disruptive Photonic Technologies” Disruptive Technologies – The idea behind

- Bring new technologies from basic research to applications:
  - Replace established technologies by new ones with higher potential
  - Enable new applications
- The proof-of-principle for the new technology should already exist
- Emphasis is on new technologies; not on new ways of using existing technologies
- Involve industrial players





## Objective 3.5 “Core and Disruptive Photonic Technologies” e) Coordination and Support Actions (CSA)

*Call 7, opens 28 Sept 2010, closes 18 Jan 2011, 5 M€*

1. ERA-NET for the coordination of national R&D programmes/activities
2. Technology road-maps for high power / high energy lasers
3. Coordination between innovation clusters
4. Targeted international cooperation activities
5. Coordination of the European photonics RTD constituency in Photonics21
6. Access of SMEs and researchers to advanced technologies, design expertise and/or manufacturing facilities
7. Education and training actions

**→ Involve the key Stakeholders in Photonics!**



## Objective 3.5 "Core and Disruptive Photonic Technologies"

### e) Coordination and Support Actions (2)

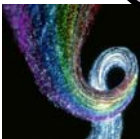
*Call 7, opens 28 Sept 2010, closes 18 Jan 2011, 5 M€*

**Expected impacts: CSAs should further the ...**

1. *[ERANET:]* ... cooperation and alignment between **national/regional and EU-wide research programmes**
2. *[High-power lasers:]* ... synergies in R&D on **high power / high energy lasers** and opening of new market opportunities
3. *[Innovation Clusters:]* ...overall effectiveness of **regional clusters and national technology platforms**
4. *[International cooperation:]* ... cooperation between **European players and their counterparts elsewhere** on common goals
5. *[EU-wide coordination:]* ... consensus building on **European research priorities and strategies**
6. *[Access:]* ... **uptake of advanced photonics technologies** by SMEs and researchers
7. *[Education and training]* ... **industry/academia collaboration in education and training**, leading to increased industrial competitiveness

# Overview

- Running Biophotonics projects
- Budget evolution
- Overview of objective 3.5 in call 7
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- Wrap-up





# ICT WP 2011-12

## Challenge 3: Alternative Paths to Components and Systems Objective 3.5 "Core and Disruptive Photonic Technologies"

### a) Core photonic technologies

Application-specific photonic components & subsystems for: **50% IP**

1. Optical data communications
2. Biophotonics for early, fast and reliable medical diagnosis of diseases
3. Imaging & sensing for safety and security
4. Lighting and displays

Cross-cutting technology:

5. Photonics integration platforms

IP

**117 M€**

**30% STREP**

Call 8, 2011  
IP + STREP

### b) Disruptive photonic technologies

Call 7, 2010, STREP

### c) ERANET-Plus action

Call 8, 2011, EN+

### d) Pre-Commercial Procurement action

Call 8, 2011, CP

### e) Coordination and Support actions

Call 7, 2010, CSA

including ERA-NET action



## Objective 3.5 "Core and Disruptive Photonic Technologies" a) Core photonic technologies

*Call 8, opens 26 July 2011, closes 17 Jan 2012, 79 M€*

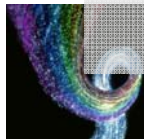
### Target Outcomes:

Advance R&D in core photonic technologies. Focus is on:

1. Application-specific photonic components and sub-systems  
Priority is on novel or 'break-through' approaches, rather than incremental developments
2. Cross-cutting technology for device integration  
→ Actions should be driven by user-requirements

### Expected Impact:

1. Reinforce European industrial leadership, competitiveness and market share and/or provide significant societal impact
2. Secure a European manufacturing base for integrated components and secure industrial leadership





## Objective 3.5 “Core and Disruptive Photonic Technologies” a.1 - Optical data communications

*Call 8, opens 26 July 2011, closes 17 Jan 2012*

**IP & STREP**

**i. Communication networks:** more transparent, dynamic, energy efficient and faster

- **Core networks:** Technology for truly cost effective transport at 100 Gb/s per channel, scalable towards 100 Tb/s systems;
- **Access networks:** Affordable technology enabling 1-10 Gb/s per client over more than 100 km

**ii. Optical interconnects:**

- Cost and energy effective technology for Tb/s optical links in short range communication
- Applications range from on-board and board-to-board links at smaller scale to links in data centres and LAN

**“Radio-over-fibre” techniques** (in access or LAN networks)

→ Consortia should include researchers, component manufacturers and suppliers of communication equipment



## Objective 3.5 "Core and Disruptive Photonic Technologies" a.2 - Biophotonics for early, fast and reliable medical diagnosis

*Call 8, opens 26 July 2011, closes 17 Jan 2012*

- Early, fast and reliable diagnosis of diseases (e.g. cancer, infectious and eye-related diseases)
- Applications: From point-of-care diagnosis to functional imaging
- Typical issues: High sensitivity, selectivity, resolution, depth of penetration
- Emphasis on strongly interdisciplinary work involving also medical/biomedical end-users
- Technical results should undergo preclinical validation, with clinical trials being excluded

**IP & STREP**





## Objective 3.5 "Core and Disruptive Photonic Technologies"

### a.3 - Imaging and sensing for safety and security

*Call 8, opens 26 July 2011, closes 17 Jan 2012*

**IP & STREP**

- i. CMOS integrated, high-performance mega-pixel image sensors** operating at room temperature and low power. Focus is on:
  - **Single-photon detection** (video-rate readout speed, very high dynamic range)
  - **Functional integration based on smart pixels** (sub-picosecond time resolution, hyper-/multi-spectral resolution, polarisation sensitivity)
- ii. Widely tuneable high-performance photonic sources** for highly sensitive, selective and reliable **detection of hazardous substances**

#### Overarching issues:

- Design goals: **compact** and **cost-effective** devices
- Technical results should be **validated** for **safety and security applications**

→ Consortia should include researchers, component manufacturers and suppliers of safety & security imaging/sensing equipment





## Objective 3.5 "Core and Disruptive Photonic Technologies" a.4 – Lighting and Displays

*Call 8, opens 26 July 2011, closes 17 Jan 2012*

**IP & STREP**

### High brightness LEDs and light engines

#### Focus on:

- Improved efficacy at high brightness (warm white with efficacy > 130 lm/W, CRI  $\geq$  90, consistent colour over 25000 hours)
- High brightness, high efficiency green components intensity peak around 540 nm
- Novel approach to white components (e.g. new phosphors, monolithic sources, hybrid approaches)

- System integration issues may be addressed (to some extent)
- Significant system / operating cost reduction potential expected

→ Consortia should involve LED suppliers and/or manufacturers





## Objective 3.5 "Core and Disruptive Photonic Technologies" a.5 – Cross Cutting Technology

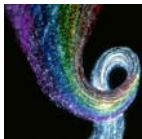
*Call 8, opens 26 July 2011, closes 17 Jan 2012*

**ONLY IP**

### Photonics integration platforms for high volume

manufacturing of photonic integrated circuits ("PICs") that combine active and passive components

- Address a range of different application fields
- Address also the relevant design, modelling and simulation tools and generic manufacturing and packaging technology
- Present a credible route to industrial manufacturing in Europe
- The technology must be scalable for increasing PIC complexity

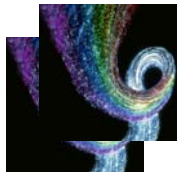




## Objective 3.5 “Core and Disruptive Photonic Technologies” c) ERANET-Plus action

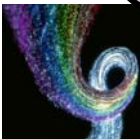
*Call 8, opens 26 July 2011, closes 17 Jan 2012, 10 M€*

- A **joint call for proposals** on a photonics topic of strategic interest, **involving national and/or regional grant programmes**
- **Expected Impact:**  
Foster cooperation and alignment between national/ regional/ EU-wide research programmes in topics of strategic interest



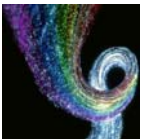
# Overview

- Running Biophotonics projects
- Budget evolution
- Overview of objective 3.5 in call 7
- Overview of objective 3.5 in call 8
- Wrap-up

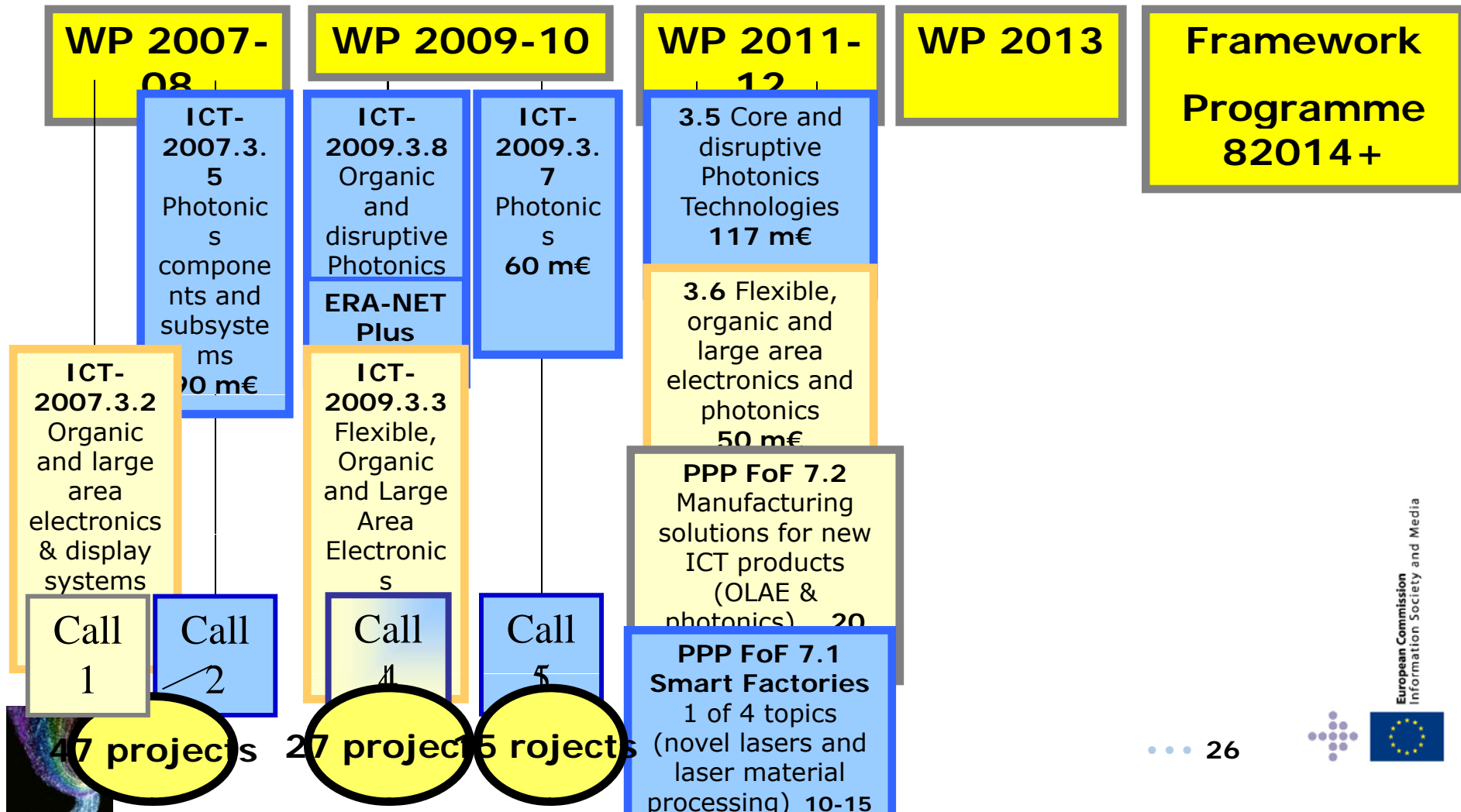


# Overview Calls

- Call 7, close 18 Jan 2011
  - Disruptive Photonics
  - Organic Electronics and Photonics
- Call 8, close 17 Jan 2012
  - Photonics
- EN+ Biophotonics, end 2012
- Workprogramme 2013
- Frameworkprogramme 8, 2014-2018?

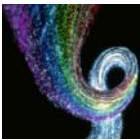
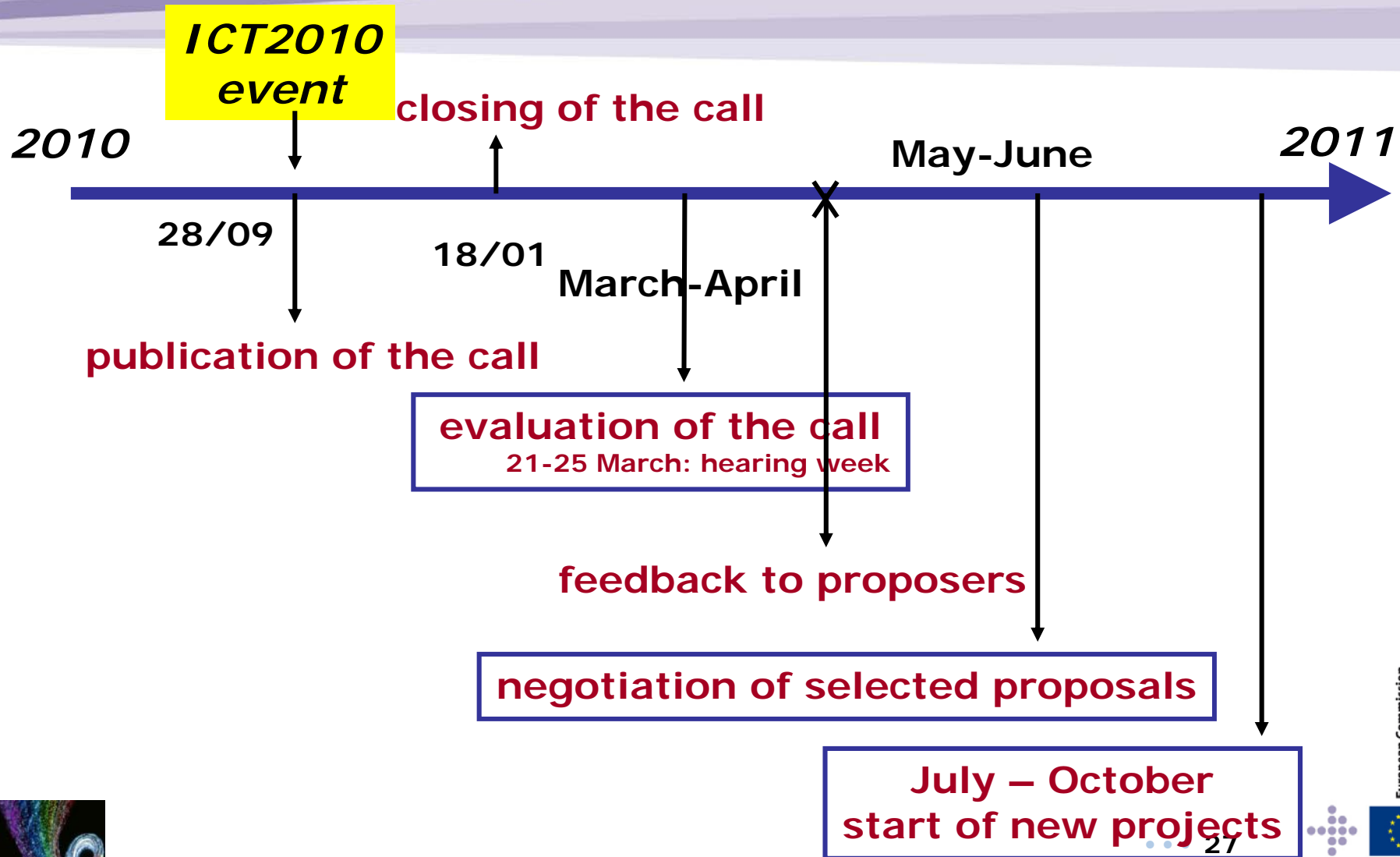


# FP7 and beyond





# Detailed timing of forthcoming call 7



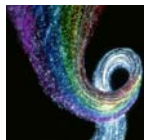


# Contact persons and pre-proposal check procedure for CALL 7

- Objective 3.5: Photonics
  - *Michael Hohenbichler*
- Send your questions to: [info-photonics@ec.europa.eu](mailto:info-photonics@ec.europa.eu)

## Pre-proposal check procedure:

- You can send a standard form ('Annex 6 of the Guide for Applicants') to [info-photonics@ec.europa.eu](mailto:info-photonics@ec.europa.eu)
- Until three weeks before closing of the call
- The advice/feedback from the EC is informal and non-binding



# More information

- General information about the calls:
  - On Cordis FP7 homepage:  
[http://cordis.europa.eu/fp7/home\\_en.html](http://cordis.europa.eu/fp7/home_en.html)
- Specific information and session presentations:
  - The ICT2010 website/this session page
  - On Cordis Photonics homepage/calls:  
[http://cordis.europa.eu/fp7/ict/photonics/calls\\_en.html](http://cordis.europa.eu/fp7/ict/photonics/calls_en.html)

