Jornada Connect-EU

Impulsa el teu projecte d'R+D i innovació a Europa

Generalitat de Catalunya

Co-organitzadors:
ACCIÓ i AGAUR

Amb el suport de:
iberCaja
enterprise europe network

Sessió - Future and Emerging Technologies (FET)

Sr. Nicolás Ojeda, NCP/Representant CP FET

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Modera: **Cristina Borràs**, AGAUR

Future and Emerging Technologies (FET)

Jornada CONNECT-EU
Barcelona, 6 de noviembre de 2017

Nicolás Ojeda – NCP/Representante CP FET

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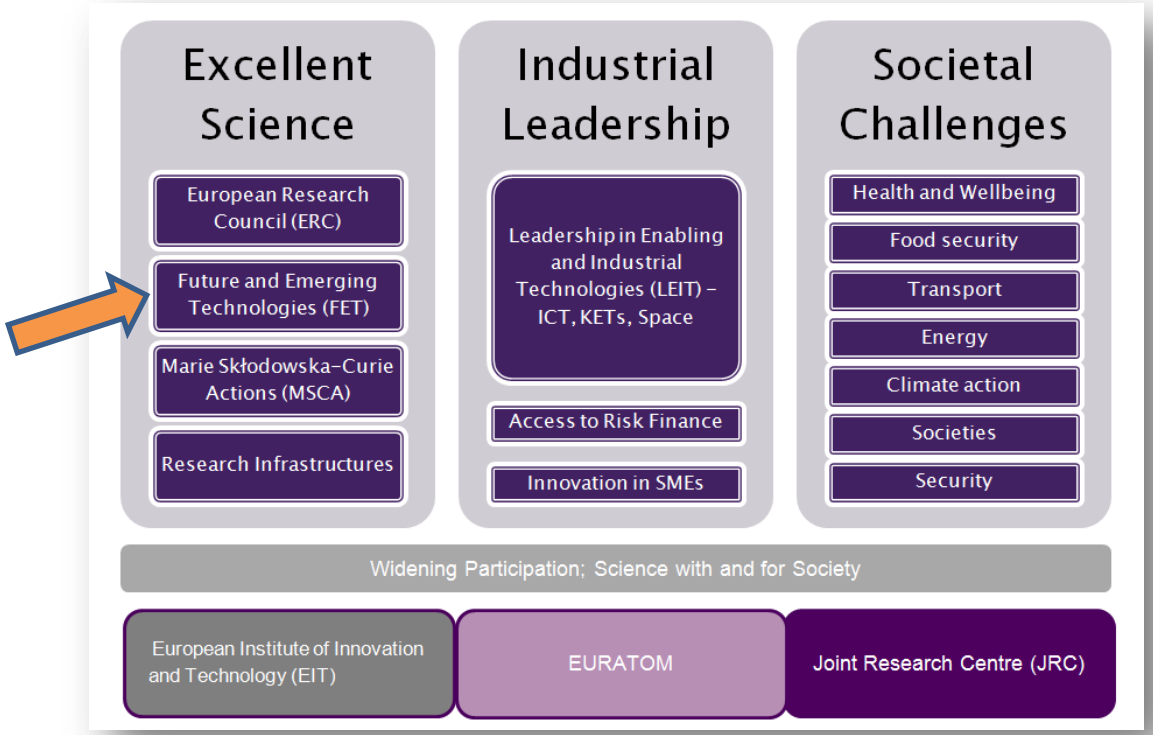
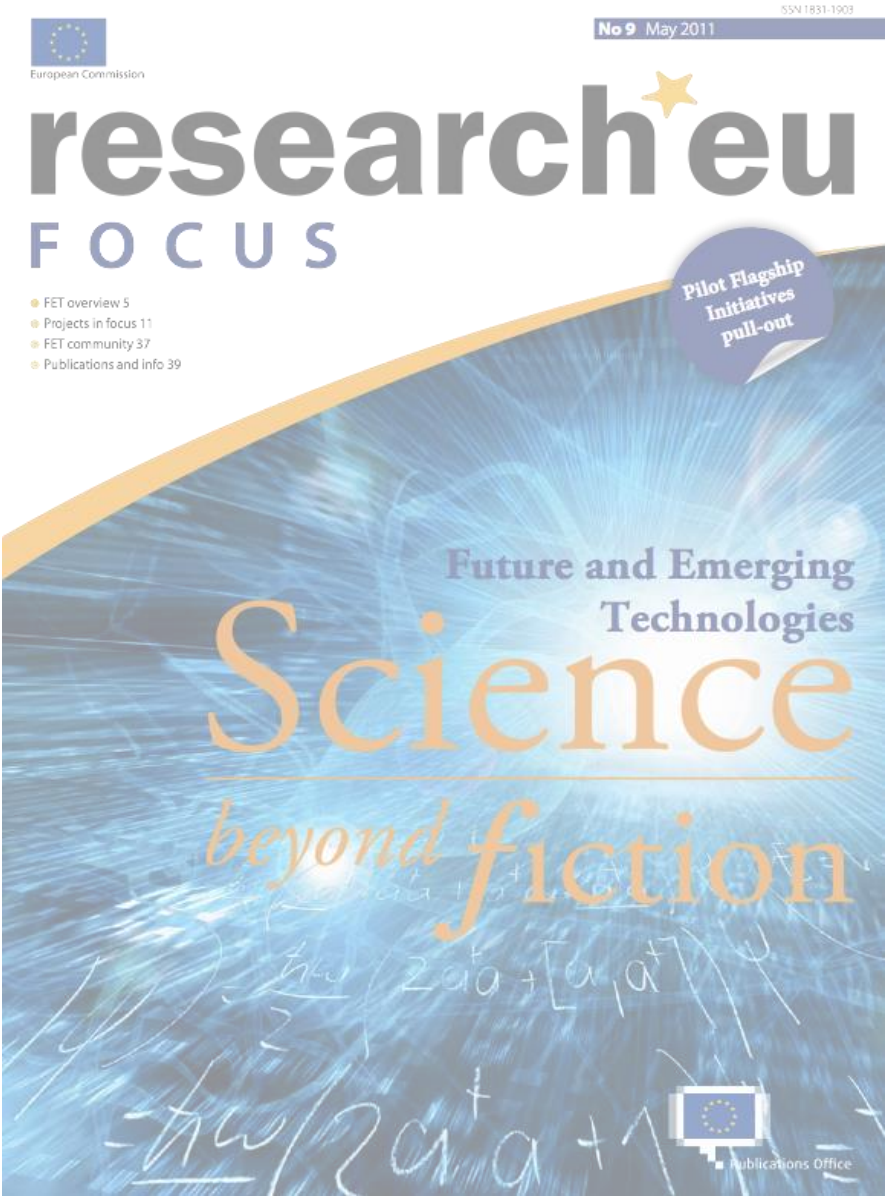
CONTENIDO

I. Horizonte 2020

Presupuesto: 75 mil millones € aprox



ERC	13.094,81 M€
FET	2.695,99 M€
MSCA	6.162,26 M€
Infrastructures	2.488,01 M€
TOTAL	**24.441,07 M€**



FET en H2020: Finalidad

"FET busca crear en Europa el medio para desarrollar una **colaboración multidisciplinar, responsable y dinámica** en tecnología futura y emergente desarrollando **nuevos ecosistemas en investigación e innovación**".

"Se pretende crear las semillas de un futuro **liderazgo industrial** que afronte con garantías y de manera novedosa **los grandes desafíos sociales**".

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FET en H2020: Objetivos

- **Investigación más allá de lo que es conocido**, aceptado o ampliamente adoptado.
- FET apoya **nuevas y visionarias** aproximaciones para desarrollar **nuevos enfoques** que abran nuevos caminos hacia **posibilidades tecnológicas radicalmente nuevas.**
- FET financia **colaboraciones interdisciplinares** fructíferas que busquen "*cross-fertilisation*" y **sinergias** entre disciplinas de vanguardia tanto científicas (ciencias de la vida, sociales, humanidades,…) como ingenierías.

Investigación de **riesgo**, que cree **nuevas ideas**, **conceptos y paradigmas** que supongan un **cambio radical** de las aproximaciones actuales.

Transversalidad y aplicación a **cualquier dominio de investigación**

FET focuses on **research beyond what is known**.

- **FET Open**: (bottom-up). **Nuevas ideas** para tecnologías radicalmente nuevas.
- **FET Proactive**: Áreas concretas. **Consolidar comunidades de investigación** y crear masa crítica.
- **FET Flagships**: Actuales y nuevas flagships.

Human Brain Project

GRAPHENE FLAGSHIP

Open, light and agile ⟷ **Roadmap based research**

FET-Open

Early Ideas

Individual research projects

Exploring novel ideas

FET Proactive

Exploration and Incubation

Topical clusters of research projects

Developing topics & communities

FET Flagships

Large-Scale Partnering Initiatives

Common research agendas

Addressing grand challenges

FET WP 2018-2020:Algunos puntos destacados

- Sigue la importancia del **potencial innovador** en cada una de las líneas FET:
  - **Fusión de FET OPEN en el EIC (European Innovation Council)**
  - Más financiación para **CSA Innovation Launchpad**.
  - Fomento de la participación de **nuevos actores**: **Jóvenes investigadores**, **High tech SMEs y nuevos participantes en FET.**
- **FETOPEN:**
  - Cambios en la definición de los **FET Gatekeepers**, reducción de 6 a 3.
  - **4 Cortes, más financiación**: mayo 2018 (127M€); Enero 2019 (160M€); Septiembre 2019 (160M€); Mayo 2020 (203M€).
  - **Excelencia/Impacto/Implementation**
- **Proactive**: 6 áreas. Proactive 1 (2018): 88M€. Proactive 2 (2020): 82M€
- **Flagships**:
  - **QuTe**: Estructura, financiación por pilares, convocatorias RIA/CSA y CSA preparatoria.
  - **Nuevas flagships**: 3 áreas, 7 topics. CSAs preparatorias.

FET WP 2018-2020

FET OPEN: Novel ideas for radically new technologies		
FETOPEN-01-2018-2019-2020 (RIA)	FET-Open Challenging Current Thinking	647,5 M€
FETOPEN-02-2018	FET-Open Coordination and Support Actions	2,0 M€
FETOPEN-03-2018-2019-2020	FET Innovation Launchpad (CSA)	8,20 M€
FET PROACTIVE: Boosting emerging technologies		
FETPROACT-01-2018	FET Proactive: emerging paradigms and communities (RIA)	88,0 M€
FETPROACT-02-2018	Community building in Neuromorphic Computing Technologies	0,50 M€
FETPROACT-03-2018	FET ERANET COFUND	6,0 M€
FET PROACTIVE: High Performance Computing		
FETHPC-01-2018 (RIA)	International Cooperation on HPC	4,0 M€
FETHPC-02-2019 (CSA&RIA)	Extreme scale computing technologies, methods and algorithms for key applications and support to the HCP Ecosystem	68,0 M€
FET Flagships: Tackling grand interdisciplinary science and technology challenges		
FETFLAG-01-2018	Partnering environment for FET Flagships	6,0 M€
FETFLAG-02-2018	ERANET Cofund for FET Flagships	10,0 M€
FETFLAG-03-2018 (RIA&CSA)	FET Flagship on Quantum Technologies	132,0 M€
	TOTAL FET 2018-2020	1,536M€

Participant Portal (H2020 Calls)
http://ec.europa.eu/research/participants/portal/desktop/en/home.html

II. FET OPEN (RIA&CSA)

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FET OPEN 2018-2019-2020

- **Acciones de Investigación e Innovación (RIA)**. Primeras etapas de la investigación científica e innovación tecnológica en torno a **nuevas ideas para desarrollar tecnologías radicalmente nuevas.**
- **Acciones de Coordinación y Apoyo (CSA)** dirigidas a facilitar la coordinación de estas actividades y el desarrollo colaborativo.
- FET OPEN supone el **40% del presupuesto**. Gestionado por REA.

FET OPEN		
FETOPEN-01-2018-2019-2020 (RIA)	**FET-Open Challenging Current Thinking**	**123,70M€+160,40M€+160,40M€+203M€**
FETOPEN -02-2018 (CSA)	**FET-Open Coordination and Support Actions**	**2 M€**
FETOPEN-03-2018-2019-2020 (CSA)	**FET Innovation Launchpad**	**2,5M€+2,7M€+3M€**
	FET OPEN WP 2018-2019-2020 WP 2014-15: 160M€ WP 2016-2017: 259,5M€	**657,7M€**

FET OPEN 2018-2019-2020 (RIA)

Acciones de investigación e innovación:

- Proyectos I+D en cualquier área o línea de investigación. No solo ICT.
- Proyectos “bottom up” pero no “blue sky research” (No ERC) Orientado a la tecnología
- **TRL 1 -3.** Resultados proyecto FET **prueba experimental** de un concepto en laboratorio.

Technology Readiness Levels

TRL 0: **Idea**. Unproven concept, no testing has been performed.
TRL 1: **Basic research.** Principles postulated and observed but no experimental proof available.
TRL 2: **Technology formulation**. Concept and application have been formulated.
TRL 3: **Applied research**. First laboratory tests completed; proof of concept.
TRL 4: **Small scale prototype** built in a laboratory environment ("ugly" prototype).
TRL 5: **Large scale prototype** tested in intended environment.
TRL 6: **Prototype system** tested in intended environment close to expected performance.
TRL 7: **Demonstration system** operating in operational environment at pre-commercial scale.
TRL 8: **First of a kind commercial system**. Manufacturing issues solved.
TRL 9: **Full commercial application**, technology available for consumers.

FETOPEN-01-2018-2019-2020 (RIA)

- Proyectos en **colaboración** (min. 3 participantes de 3 países)
- **3 M€** por proyecto
- **36/48 meses** de duración.
- Propuestas de **16 páginas** (15+1)
- ***Single step submission***.
- **4 *cut-off dates***

Aspectos más repetidos en las convocatorias anteriores:

- 5 socios por proyecto
- Socios de 4 países diferentes
- Duración de 36 meses

Tipo de acción	Presupuesto			Deadlines
	2018	2019	2020	
FETOPEN-01-2018-2019-2020 (RIA)	123,70 M€	160,40 M€ 160,40 M€	203,00 M€	15 mayo 2018 23 enero 2019 27 septiembre 2019 13 mayo 2020

El 60% de los proyectos financiados tienen al menos una PYME, el 76% un socio industrial.

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FETOPEN WP2016/2017

What it takes to succeed in FET OPEN

Timo Hallantie´s blog – Head of Unit FETOPEN

Video FET Gatekeepers: https://www.youtube.com/watch?v=oTEzxpz69TU

- **Long-term vision**
- **Breakthrough scientific and technological target**
- **Novelty**
- **Foundational**
- **High-risk**
- **Interdisciplinary**

FET Gatekeepers WP2018-2020

Scope: Proposals are sought for cutting-edge **high-risk /high-impact interdisciplinary** research with all of the following essential characteristics ("FET gatekeepers"):

- **Radical vision:** the project must address a **clear and radical vision**, enabled by a **new technology concept** that challenges current paradigms. In particular, research to advance on the roadmap of a well-established technological paradigm, even if high-risk, will not be funded.

- **Breakthrough technological target**: the project must target a **novel and ambitious science-to-technology breakthrough** as a **first proof of concept** for its vision. In particular , blue-sky exploratory research **without a clear technological objective** will not be funded.

- **Ambitious interdisciplinary research** for achieving the **technological breakthrough** and that opens up **new areas of investigation**. In particular, projects with only **low-risk incremental** research, even if interdisciplinary, will not be funded.

The **inherent high risk** of the research proposed shall be mitigated by a **flexible methodology** to deal with the considerable science-and-technology uncertainties and for choosing alternative directions and options.

CRITERIOS DE EVALUACIÓN

Compliance with FET Gatekeepers!!

Contribution to impacts listed in the WP!!

Excellence	Impact	Implementation
Clarity of the **radical vision** of science-enabled technology and **its differentiation from current paradigms**. **Novelty** and ambition of the proposed science-to-technology **breakthrough** that addresses this vision. Range of and added value from **interdisciplinary** for opening up **new areas of research; non-incrementality** of the research proposed. **High-risk, plausibility** and **flexibility** of the research approach.	The extent to which the outputs of the project would contribute to the **expected impact listed** in the Work Programme under this topic. Effectiveness of **measures and plans to disseminate** and use the results (including **management of IPR**) and to **communicate** about the project to different target audiences.	**Coherence** and **effectiveness** of the **research methodology** and **work plan** to achieve project objectives and impacts, including **adequate allocation of resources** to tasks and partners. **Role and complementarity** of the participants and extent to which the consortium as a whole brings together the **necessary expertise.**
Threshold: 4/5 P. 60%	Threshold: 3.5/5 : 20%	3/5 P: 20%

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FET-Open evaluation outcome (WP2014-15 cut-offs)

Convocatorias	2014	2015 - 1	2015 - 2	2016	2017(1 y 2)
Presupuesto	77 M€	38,5 M€	38,5 M€	84 M€	84M€+84M€

Call Topic	Propuestas elegibles	Above threshold	% propuestas above threshold	Retained proposals	Success rate
FETOPEN-2014-2015-RIA 1º corte	639	254	39,7%	24	3,7%
FETOPEN-2014-2015-RIA 2º corte	665	326	49%	11	1,6%
FETOPEN-2014-2015-RIA 3º corte	800	346	43,25%	11	1,4%
Total	**2104**	**926**	**44%**	**46**	**2,2%**

FET-Open evaluation outcome (WP2016-17 cut-offs)

Convocatorias	2014	2015 - 1	2015 - 2	2016	2017(1 y 2)
Presupuesto	77 M€	38,5 M€	38,5 M€	84 M€	84M€+84M€

Call Topic	Propuestas elegibles	Above threshold	% propuestas above threshold	Retained proposals	Success rate
FETOPEN-2016-2017-RIA 1º corte	544	272	50%	22	4%
FETOPEN-2016-2017-RIA 2º corte	365	192	52%	26	7,1%
FETOPEN-2016-2017-RIA 3º corte	403	?	?	28*	6,95*
Total	-	-	-	-	-

*Previsión OE

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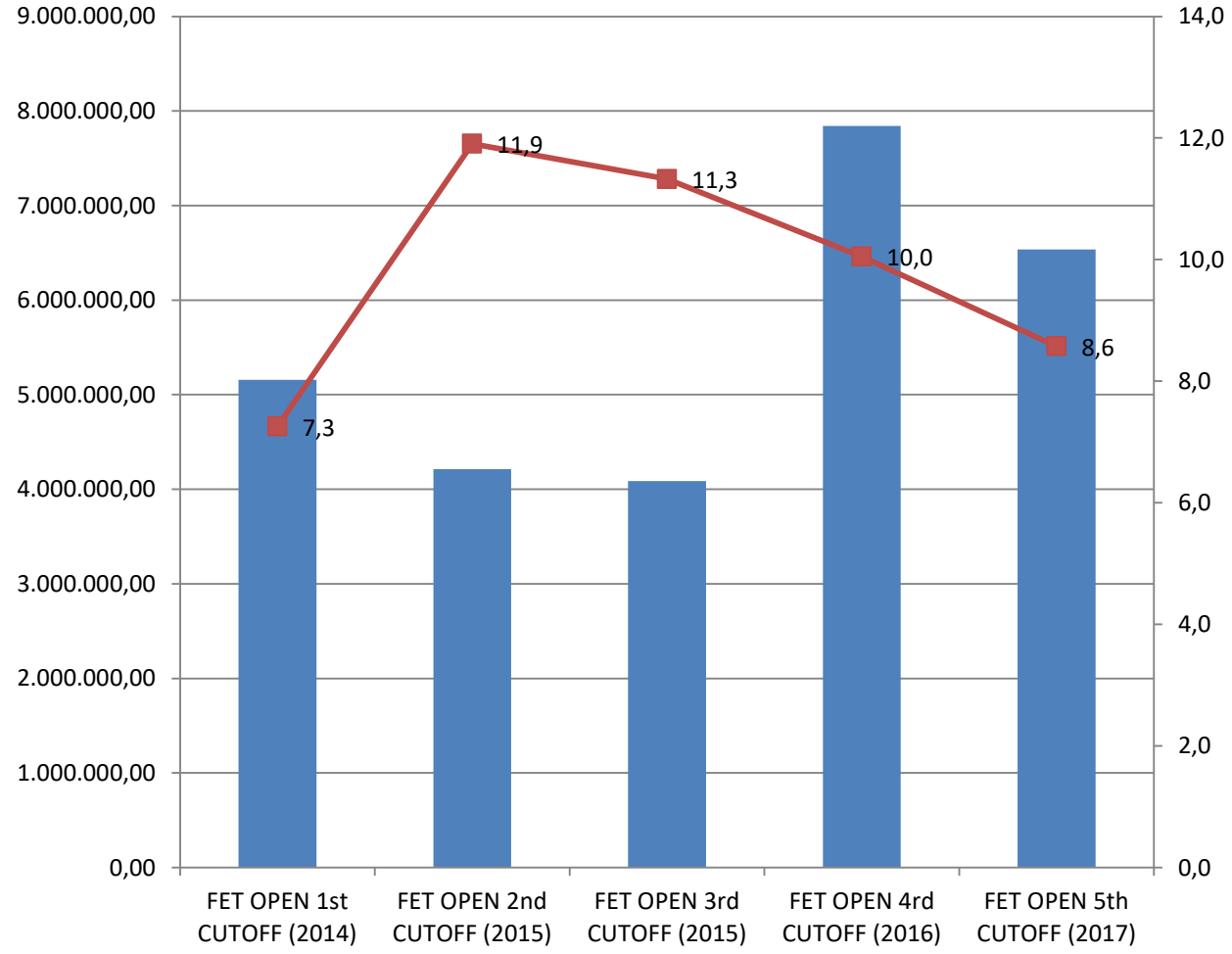
FET OPEN RIA WP 2014/15 y WP 2016/17
Participación entidades españolas



Sept 2014: 7,3 % UE28 – 4º

Marzo 2015: 11,9% UE28 – 3º

Sept 2015: 11,3% UE 28 – 3º

Mayo 2016: 10% UE 28 – 4º

Enero 2017: 8,6% - 5º

Septiembre 2017: ?

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FETOPEN-03-2018-2019-2020 (CSA) INNOVATION LAUNCHPAD

- **Reto específico: Incrementar el potencial innovador de FET** financiando actividades no previstas en los GA que permitan facilitar aplicaciones comerciales de los resultados de los proyectos.

- Para los **proyectos FET del 7PM/H2020** recientemente finalizados o a punto de terminar.

- Para financiar **modelos de negocio, definición planes de comercialización, consolidación de una estrategia IPR, desarrollo contactos que faciliten llegada a mercado** (inversores, socios industriales, end users,…) **Complementario** a otros instrumentos para desarrollo de negocios y SMEs

- Proyectos de **máximo 18 meses**, máximo **0,1 M€**. Propuestas de 7 páginas.

Tipo de acción	Presupuesto			Deadlines
	2018	2019	2020	
FETOPEN-04-2016-2017 (CSA) (opening 1 march 2016)	2,5 M€ M€	2,70 M€	3,00 M€	16 Oct 2018 8 Oct 2019 14 Oct 2020

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FET-Open INNOVATION LAUNCHPAD evaluation outcome

Convocatorias	2016	2017
Presupuesto	1,2M€	1,8M€

Call Topic	Propuestas elegibles	Financiadas	Tasa éxito	Nota de corte
FETOPEN Innovation Launchpad (26 septiembre 2016)	88	16	18,2%	4,3
FETOPEN Innovation Launchpad (27 septiembre 2017)*	54*	18*	33,3%*	?

Webinar Innovation launchpad convocatoria de 12/05/2017:
https://webcast.ec.europa.eu/fet-innovation-launchpad-cut-off-27-09-2017

Primeros 16 proyectos financiados:
https://ec.europa.eu/programmes/horizon2020/en/news/fet-innovation-launchpad-first-cut-16-projects-chosen

III. FET PROACTIVE
- Boosting emerging technologies (BET)
- High Performance Computing (HPC)

FET PROACTIVE: BOOSTING EMERGING TECHNOLOGIES

Proyectos con resultados concretos para:

- Madurar **nuevas áreas estructurando comunidades emergentes** y apoyando el diseño y desarrollo de temas científicos transformadores y **nuevas comunidades de investigación interdisciplinaria.**
- Establecer cimientos e **impulsar ecosistemas innovadores** en nuevas tecnologías emergentes

WORK PROGRAMME 2018-2019-2020

- **6 topics** identificados tras consulta pública y otras fuentes (Comité Programa, FETAG, ETP4HPC, …)
- Propuestas: 30+1 páginas.
- **Proyectos entre 4-7 M€,** duración de hasta **5 años**. 3 a 8 socios por proyecto.
- Un solo *deadline, one step submission*.
- Para 2020 topics aun por definir.

III. FET PROACTIVE: Boosting Emerging Technologies

WP 2014 - 15

- Sistemas científicos globales (GSS)
- Knowing, doing, being
- Cognición más allá de resolución de problemas
- Simulación cuántica

Presupuesto total: 35 M€

WP 2016 - 17

Area 1: Future technologies for societal change
Area 2: Biotech for better life
Area 3: Disruptive information technologies
Area 4: New technologies for energy and functional materials

Presupuesto total: 95 M€

Proyectos entre 4-10 M€ y hasta 5 años

WP 2018 – 2020: Proactive 1 (2018)

- **Artificial organs, tissues, cells and sub-cellular structures**.(15 M€)
- **Time**. (13M€)
- **Living technologies** (20M€)
- **Socially interactive technologies** (15M€)
- **Disruptive micro-energy and storage technologies** (15M€)
- **Topological matter** (10M€)

+ CSA on Neuromorphic Computing Technologies (0,5M€)

- **RIA: 4-7M€** (Topological Matter hasta **5M**€)
- **Total budget: 88 M€**
- Projects up to **5 years**

- **Topics Proactive 2 (2020)** still to be defined.
- Total budget: 82 M€

FETPROACT-01-2018: Emerging paradigms and communities

Artificial organs, tissues, cells and sub-cellular structures. Merging the growing understanding of **genome, proteome, metabolome and cell behaviour** with strategies for the engineering and use of biological and hybrid functional constructs is the core of this initiative. Proposals should build on recent advances in **integrative biology** (including modelling and simulation) and **bio-engineering** for engineering biological, artificial or hybrid sub-cellular systems (e.g., synapses, organelles, vesicles), highly specific cell assemblies (including microbial) and proper differentiation, tissues, organs or multi-organ systems. Examples of long-term research targets include **synthetic cell building, cell assembly, and organ reproduction, replacement, control or repair of vital organ functions** (e.g., following ageing, trauma or disease), their use in the development of personalised treatment, drugs or vaccines, and high-throughput organ- and body-on-chip technologies. **(15MEuro)**

Time. This initiative seeks **new technological possibilities inspired by notions of time**, not seen as a given and singular background against which things unfold, but rather as a resource that can be experienced and used in different ways. Highly interdisciplinary research could address, for instance, **technologies for subjective time awareness** (and its neural basis) and distortion (e.g., contextual, emotional, pathological); for studying the role of **time in processes like aging, healing, learning or evolution** and how this can be influenced (e.g., stimulation) or changed in different 'materialities' (combining insights from biological or computational evolution, for instance); or modeling to understand and better anticipate non-linear temporality in complex systems (such as in economies, societies, climate ...). Technologies in for instance, extreme electronics/photonics, data-streams analytics, time aware artificial intelligence, virtual and augmented reality, **bio-engineering or neuroprosthetics could demonstrate new ways to represent, modulate, duplicate or differently experience and use time, thus altering our relationship with time** (at individual and collective but differentiated level – e.g., according to gender or culture) and with impacts on, for instance, quality of life, therapy, learning, productivity, social and environmental awareness or the better understanding and management of natural hazards. **(13MEuro)**

FETPROACT-01-2018: Emerging paradigms and communities

Living technologies. This initiative seeks to build on the emerging understanding from **evolutionary biology, ethology, micro-, plant- and animal biology** of essential features of living systems such as p**hysical autonomy, growth, interaction and enaction, adaptation and evolution**, among others. The aim is **to create new functional biological, technological or hybrid artefacts,** with similar capabilities of purposeful stability and change. This can also lead to hybrid materials and systems with programmable features of shape, structure, functionality and evolvability (including for their use in bio-robotics or bio-engineering), potentially constructed from naturally existing complexes, through synthetic biology, systems biology and /or chemical biology. New insights into the multi-level mathematics and complexity of living systems or the boundaries/characteristics of life may also emerge from this. Work on ethical implications should be included. **(20MEuro)**

Socially interactive technologies. There is a growing understanding of **the changes at cognitive, neural and physiological levels from group interactions in realistic settings**, from pairs to large groups and crowds. Based on this, this initiative seeks **new technologies for deeper social interaction involving**, for instance, **context, culture, emotion, and factors of embodiment and cognition**. Realistic and larger contexts require **new experimental tools and paradigms, combining social sciences and humanities with neuroscience, engineering and computing in new ways**. This will lead to new socially interactive media with radical improvement for building trust and understanding, social integration, engagement, collaboration, learning, creativity, entertainment, education and wellbeing, among others. Work on ethical implications and gender should be included **(15MEuro)**

FETPROACT-01-2018: Emerging paradigms and communities

Disruptive micro-energy and storage technologies. This initiative seeks radically **new approaches to energy for embedded, personal or local use** (including bio-mimicking, the use of soft or intelligent materials to generate, capture or store energy or the development of new types of batteries). Proposals could target in particular the lower end (i.e., micro-energy or nano-scale energy transfer, dissipation and conversion) and/or new technologies for optimal local (close to where-needed) **energy storage/release and their smart integration within hybrid/distributed energy systems**. Proposals should also address aspects of sustainability and environmental impact. **(15MEuro)**

Topological matter, strongly based on **topology and quantum physics**, is a rapidly emerging area that after an initial focus on insulators now touches the whole range of **material properties, providing advances in spintronics, photonics, plasmas, mechanics, superconductivity, elasticity, acoustics and their combinations**, among others. Here concept development together with design, realisation and testing of topological devices are called for to unleash the promise of **topological matter beyond the pure physics and mathematics aspects.** The much expected robustness, wide spectral range and topologically-protected spin- and transport properties call for an engineering approach to apply the multi-physics of wave-matter interactions to novel, potentially lossless communication components and circuits. Challenges to be addressed include **compact designs and fabrication technologies**, setting figures of merit and benchmarks relevant to functions. **(10MEuro)**

FETPROACT-02-2018 (CSA): Community building in Neuromorphic Computing Technologies

Finalidad:

- *Network* and *Coordinate* a la comunidad científica europea (académica e industrial) en torno a las tecnologías en computación neuromórfica (NMC).

- Mostrar la variedad de tecnologías en NMC y su aplicabilidad en computación cognitiva y su capacidad en el aprendizaje permanente.

- Estimular el interés industrial y las inversiones en NMC.

- Desarrollo de actividades divulgativas sobre los beneficios de NMC.

Topic que surge de la flagship HBP: https://ec.europa.eu/digital-single-market/en/news/brainscales-human-brain-project-neuromorphic-computing-coming-age

FETPROACT-03-2018: FET ERANET COFUND (CHISTERA IV)

Finalidad: Avanzar en el ERA en temas FET asociados a ICT: www.chistera.eu

Fechas convocatorias 2018 y 2020

Tipo de acción	Presupuesto (2018)	Deadlines
Abre 31 octubre 2017		
FETPROACT-01-2018 (RIA)	**88,0 M€**	**22 marzo 2018**
FETPROACT-02-2018 (CSA)	**0,5 M€**	
Abre 5 junio 2018		
FETPROACT-03-2018 (ERANET)	**6 M€**	18 diciembre 2018
Total	**94,5 M€**	

Para los topics de 2020 se abrirá otro proceso de consulta pública, asesoramiento FETAG, votación en Comité Programa FET, etc.

FET PROACTIVE: HIGH PERFORMANCE COMPUTING

Finalidad:

- To create **world-class European HPC ecosystem** towards **exascale performance**.

- Actividad basada en la **estrategia para HPC** complementando las establecidad en otras partes del Programa H2020 como **e-infrastructures, LEIR, PPP on HPC y ETP4HPC**.

- Se busca crear un ecosistema académico e industrial en **Europa** para que sea **líder mundial** de la actividad en **High Performance Computing and Big Data (HPC/BD) para el año 2023**.

FET PROACTIVE: High Performance Computing		72 M€
FETHPC-01-2018	International cooperation on HPC	4 M€
FETHPC-02-2019 (RIA)	Extreme scale computing technologies, methods and algorithms for key applications and support to the HPC ecosystem	64 M€
FETHPC-02-2019 (CSA)		4 M€

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FETHPC-01-2018: International cooperation on HPC (CSA)

- Desarrollar partenariados estratégicos en HCP entre socios UE con **Brasil y México**

- Para desarrollar aplicaciones basadas en HCP sobre temas de **energía**, **ciencias de la vida, ehealth** (farmacología relacionada con el Zika dengue,…), **ciencias de la tierra** (cambio climático, desastres naturales, …)

- Proyectos de **hasta 2 M€** (topic con 4 M€ de presupuesto).

- **Los socios brasileños y mexicanos no reciben financiación UE**.

FETHPC-02-2019: Extreme scale computing technologies, methods and algorithms for key applications and support to the HCP ecosystem. (RIA y CSA)

- **RIA: Finalidad:** Desarrollo de tecnologías computacionales, metodologías y algoritmos a través de un co-diseño fomentando la colaboración de los actores más relevantes del sector.
  - Las propuestas deben adscribirse al menos a una de estas áreas:
    - System software and management
    - Programing environments
    - I/O Storage environment for data-centric extreme scale computing
    - Data-intensive supercomputing and emerging HPC use modes.
    - Mathematical methods and algorithms.
  - Proyectos entre 5 y 10 M€ y con una duración de 3 años.

CSA Finalidad: Desarrollo de actividades para **estructurar la comunidad en HPC**, promoviendo la **colaboración y sinergias entre proyectos** del programa H2020, centros de excelencia en HPC (CoEs), extreme scale demonstrators (EsD), creando enlace con actividades de **Big Data** y otras actividades HCP relevantes.

- **Proyecto de hasta 4 M€ , presupuesto de 4 M€**.

Tipo de acción	Budget		Deadlines
	2018	2019	
Abre 31 octubre 2017			
FETHPC-01-2018 (RIA)	4.00		**10 abril 2018**
Abre 31 octubre 2018			
FETHPC-02-2019 (CSA)		**4.0**	**24 septiembre 2019**
FETHPC-02-2019 (RIA)		**64.0**	
Total budget	4.00	68.0	

IV. FET FLAGSHIPS
Graphene&HBP
Quantum Technologies
Flagships consultation

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FET Flagships address ambitious S&T challenges that require:

- Setting up **large-scale partnerships** that bring together the leading researchers from a large number of research organisations (academia and industry) aiming at transformational impacts with substancial benefits for European competitiveness and for society.
- Commitment to a **strong science investment over a long time period** that cannot be carried out alone by the Commission or any single Member State.

Human Brain Project

HBP will develop six ICT platforms, dedicated respectively to **Neuroinformatics**, Brain Simulation, High Performance Computing, Medical Informatics, Neuromorphic Computing and Neurorobotics.

Coordinator: Ecole Polytechnique Federale Laussane (EPFL)

- + 140 european research groups.
- ES: UPM, UAM, UB, UG, UPF, BSC, URJC, CSIC and U.C. Mancha

GRAPHENE FLAGSHIP

To take graphene from the realm of academic laboratories into European society in the space of 10 years, thus generating economic growth, new jobs and new opportunities.

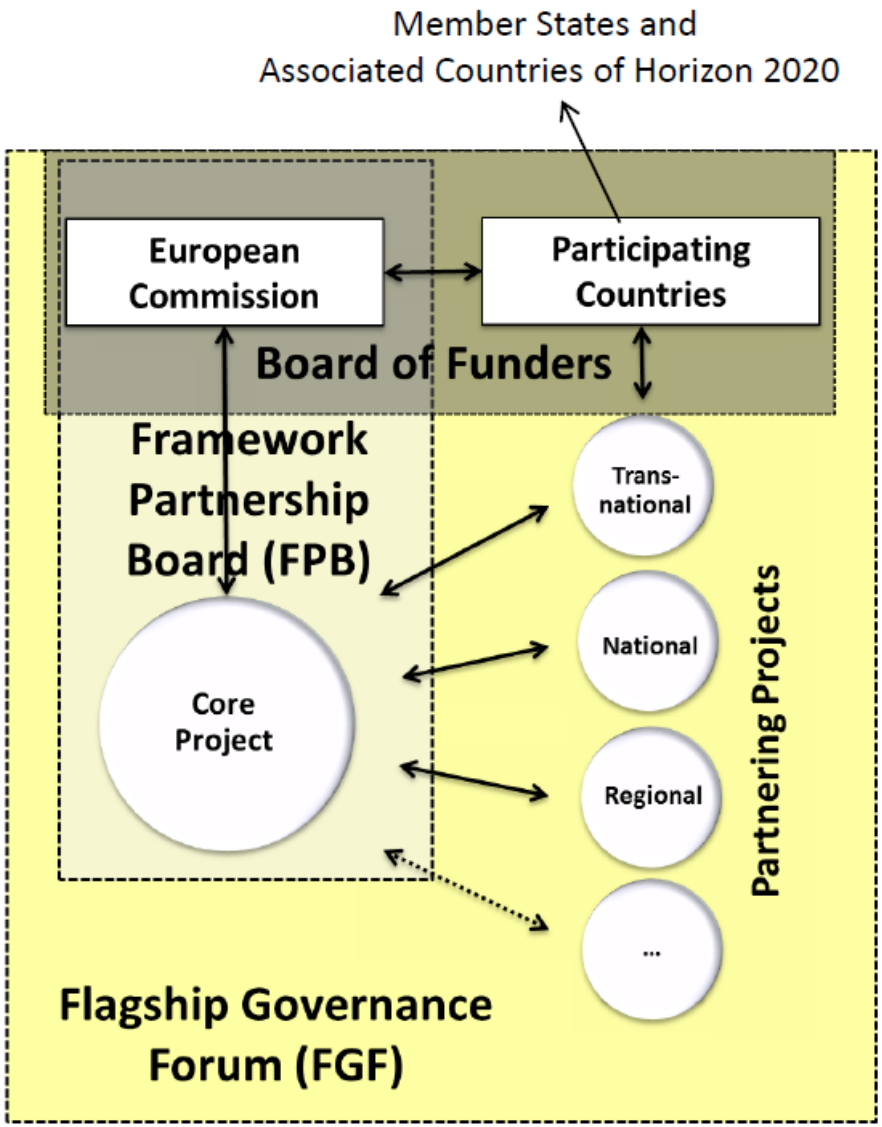
Coordinator: Chalmers University

- + 140 european research groups.
- ES: CSIC, UAB, CIC NanoGUNE, ICN, UC Mancha, UZ, Ciber BBN, Instituto AgustPI, Airbus, Avanzare, Graphenea, Antolin, REPSOL, TECNALIA, nVision S&T, ITQER

FET FLASGHIPS Partnering projects

The implementation model of the Flagships aims to link together and ensure **coordination and synergy** of all those research activities relevant for the Flagship that are **funded by the Commission and the Member States**.

Partnering Projects are projects supported by **national/regional funding agencies and/or by private funding**. They are addressing areas relevant for the Flagships and contribute to their objectives.



Flagship en QT

Convocatoria abierta!
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/fetflag-03-2018.html

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New flagships topics

- **Presupuesto: 6 M€ (Máximo 1M€ por proyecto)**
- **4-6 pilotos, por medio instrumento Coordination Support Action (CSA)**
- **12 meses duración.**
- **Proceso de evaluación a dos fases.**

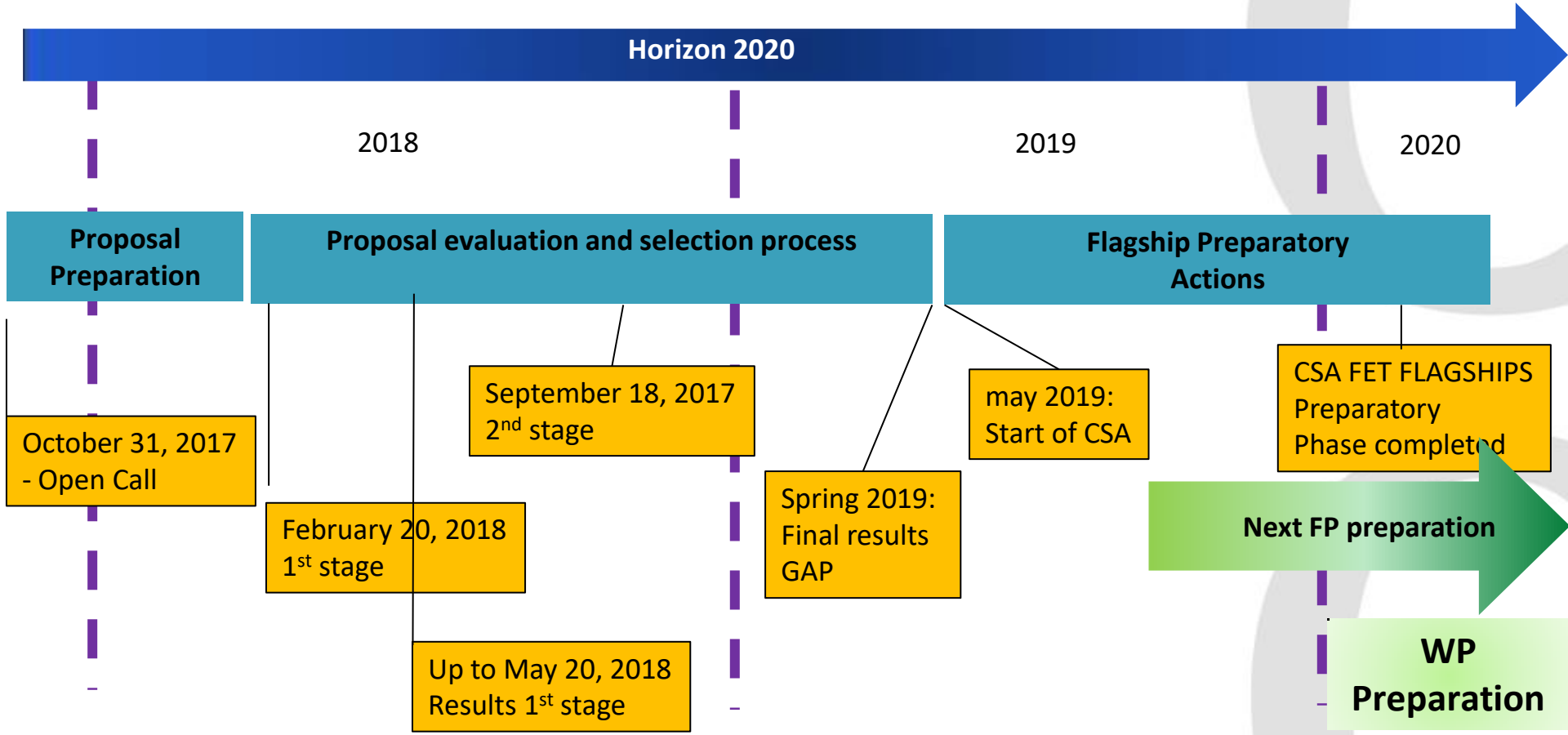
Opening: 31 Oct 2017		
FETFLAG-01-2018 (CSA)	**6.00**	**1º fase: 20 Feb 2018** **2º fase: 18 Sept 2018**

For two stage procedure:

- Information on the outcome of the evaluation: **Maximum 3 months** from the final date for submission for the **first stage** and **maximum 5 months** from the final date for submission for the **second stage**; and
- Indicative date for the signing of grant agreements: **Maximum 8 months** from the final date for submission of the **second stage**.

Convocatoria abierta!
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/fetflag-01-2018.html

Timeline for new FET-Flagships call (two stage scenario)



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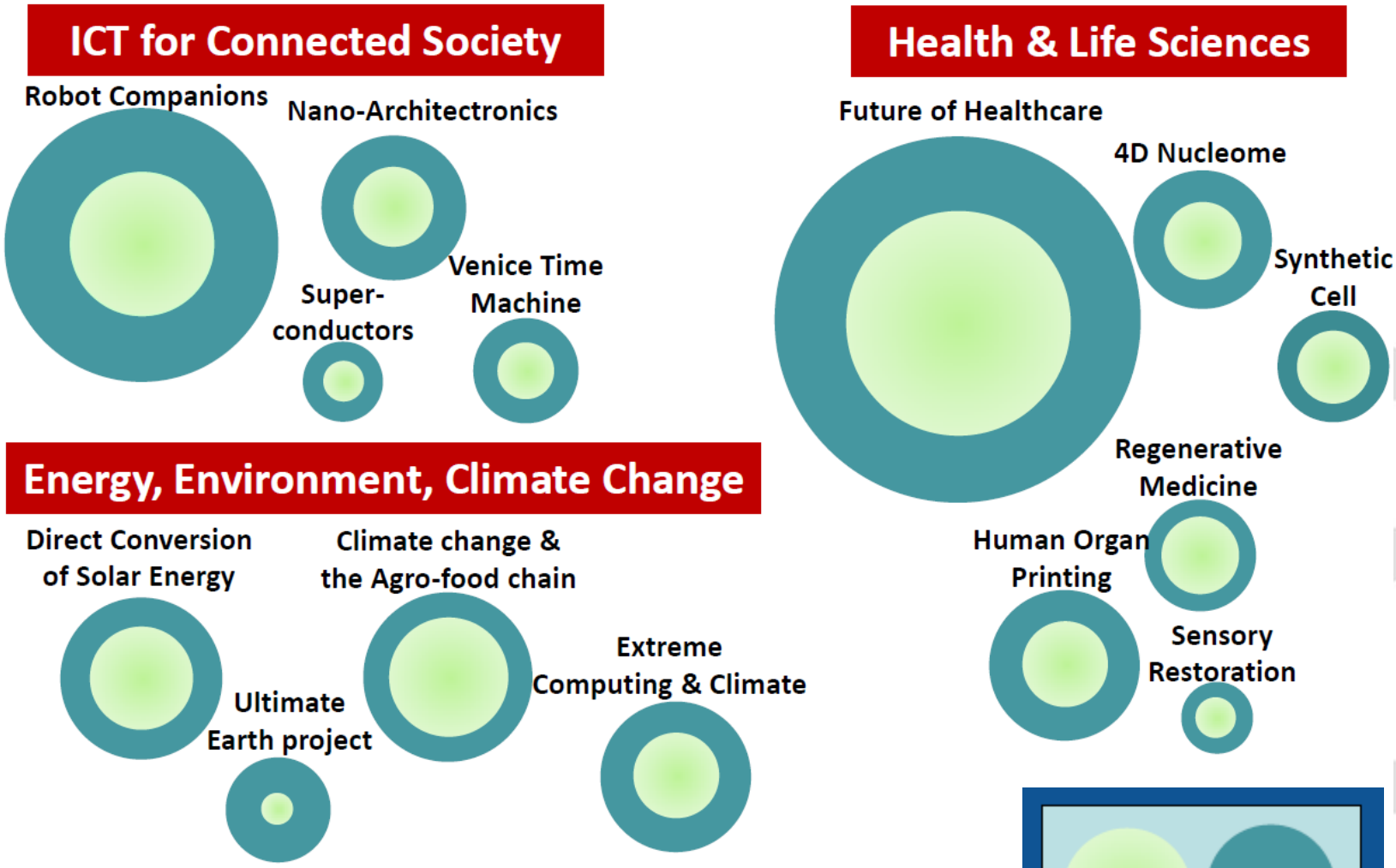
Flagships Member States consultation -15th December 2016



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WP FET 2018-2020: New flagships topics

(1) ICT and Connected Society

Smart Materials and Nanoscale Engineering: Novel nano-engineered materials and systems with properties enabling the design and manufacturing of radically new ICT components and devices creating disruptive technologies and market opportunities, for example in **energy efficiency, data processing, smart manufacturing, smart interfaces, nano-bio devices, etc.**

Robotics, Interfaces and Artificial Intelligence: a **new generation of robotics technologies** including soft and flexible robotics, bio-inspired robotics, new approaches to **human-machine interaction** and cooperation, **cognition and artificial intelligence**, giving rise to much smarter systems performing sophisticated functions opening radically new opportunities to address societal and economic challenges.

ICT for Social Interaction and Culture: new ICT technologies and approaches for empowering deep **social interactions** across diverse cultures, languages, goals, values, etc.; for understanding large-scale complex socio-technical systems and their interactions, interdependencies and evolutions and avenues for exploiting this understanding; and/or for **collecting, preserving, studying and promoting Europe's unique cultural heritage** and exploiting these to achieve major societal or economic benefits.

New flagships topics – WP FET 2018-2020

(2) Health and the Life Sciences

Disruptive technologies to Revolutionise Healthcare: New technologies and approaches aiming at a paradigm shift in the field of **individualised prevention, prediction and treatment of diseases.** This includes among others **bioinformatics** and **modelling approaches** to use patients' **genetic** expression patterns, metabolism and derived systems; novel and innovative **nano-medicine approaches** (e.g. technologies for novel sensors and imaging, organ-on-a-chip and bio-electronic medicine, drug delivery, …); **network medicine; neuro-prosthetic technologies; regenerative medicine and biofabrication techniques** to reprogram or replace human cells, tissues and whole organs and to integrate these in functioning body systems.

Understanding Life by Exploring the Genome and the Cell: Novel technologies and approaches that enable a paradigm shift in studying and understanding the foundational building blocks of life, for example **the functioning of the cell**, and of **cells within organisms**, including structure and dynamics, and the **full multi-omics** (genome/epigenome/proteome/metabolome/connectome etc.) and their interactions. This will open up radically new opportunities such as **developing novel nano-bio devices** and technologies, advanced screening methods and analytical and morphological technologies, advanced therapies and contribute to the understanding of biological processes and pathological mechanisms.

New flagships topics

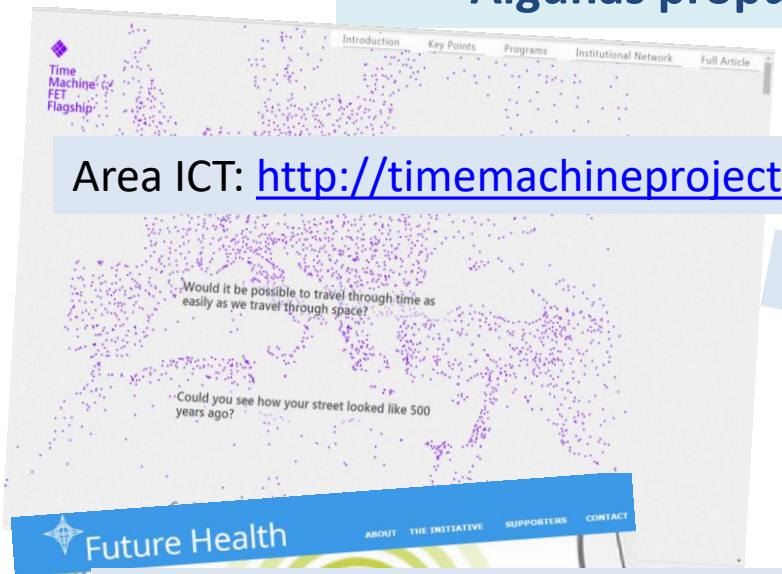
(3) Energy, Environment and Climate change

Earth, Climate Change and Natural Resources: New technologies and approaches for **high-precision modelling and simulation**, including the necessary **data integration**, that enable an in-depth understanding of the earth, natural hazards and climate change. Their exploitation and use should open up new opportunities for helping **to manage/mitigate their effects and impacts on human activity and natural resources** in a sustainable way in specific areas such as: agriculture (ensuring food security and sustainable farming), forestry, fisheries, protecting/restoring natural ecosystems, energy supply and demand, etc.

Radically new Energy Production, Conversion and Storage devices and systems: Disruptive technologies aiming at a paradigm shift in renewable energy by exploring and exploiting **radically new principles and novel materials** that can substantially reduce Europe's dependence on fossil fuels and open new industrial opportunities for their exploitation and sustainable development.

New flagships topics

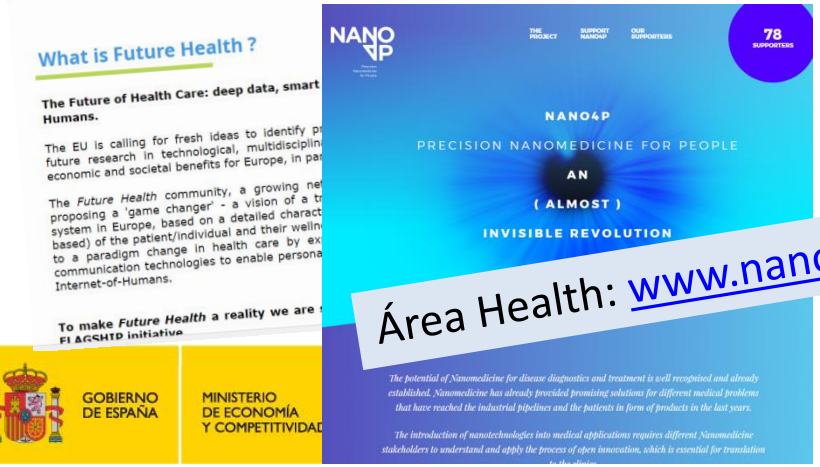
Algunas propuestas en preparación



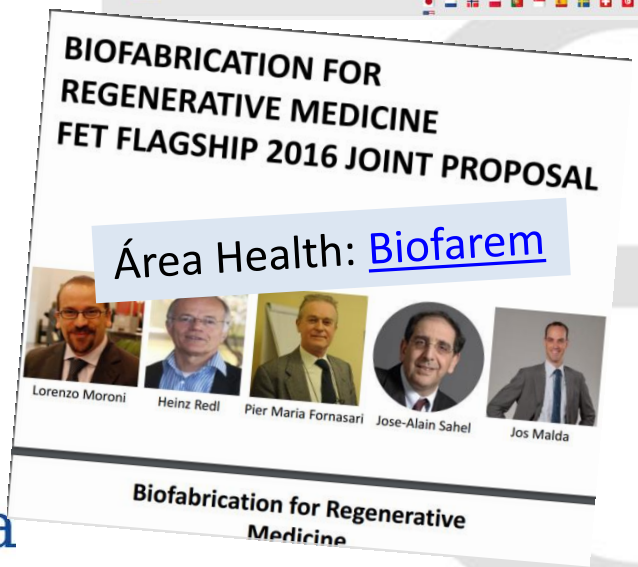
Area ICT: http://timemachineproject.eu/

Área Health: https://www.4dnucleome.eu/

Área Health: www.futurehealtheurope.eu



Área Health: www.nano4p.eu



Área Health: Biofarem

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Situación actual CSAs

- Actualmente **proceso de configuración de consorcios** en las posibles propuestas CSA.
- **Varias fusiones entre propuestas**, prácticamente **dos/tres propuestas** por cada una de las áreas.
- **Participación española activa** en todas las propuestas que se están preparando.

INFODAY NEW FLAGSHIPS
En MINECO con participación de la Comisión Europea: 15 noviembre

https://eshorizonte2020.es/ciencia-excelente/tecnologias-futuras-y-emergentes-fet/eventos/infoday-sobre-nuevas-fet-flagships

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V. Enlaces de interés e información

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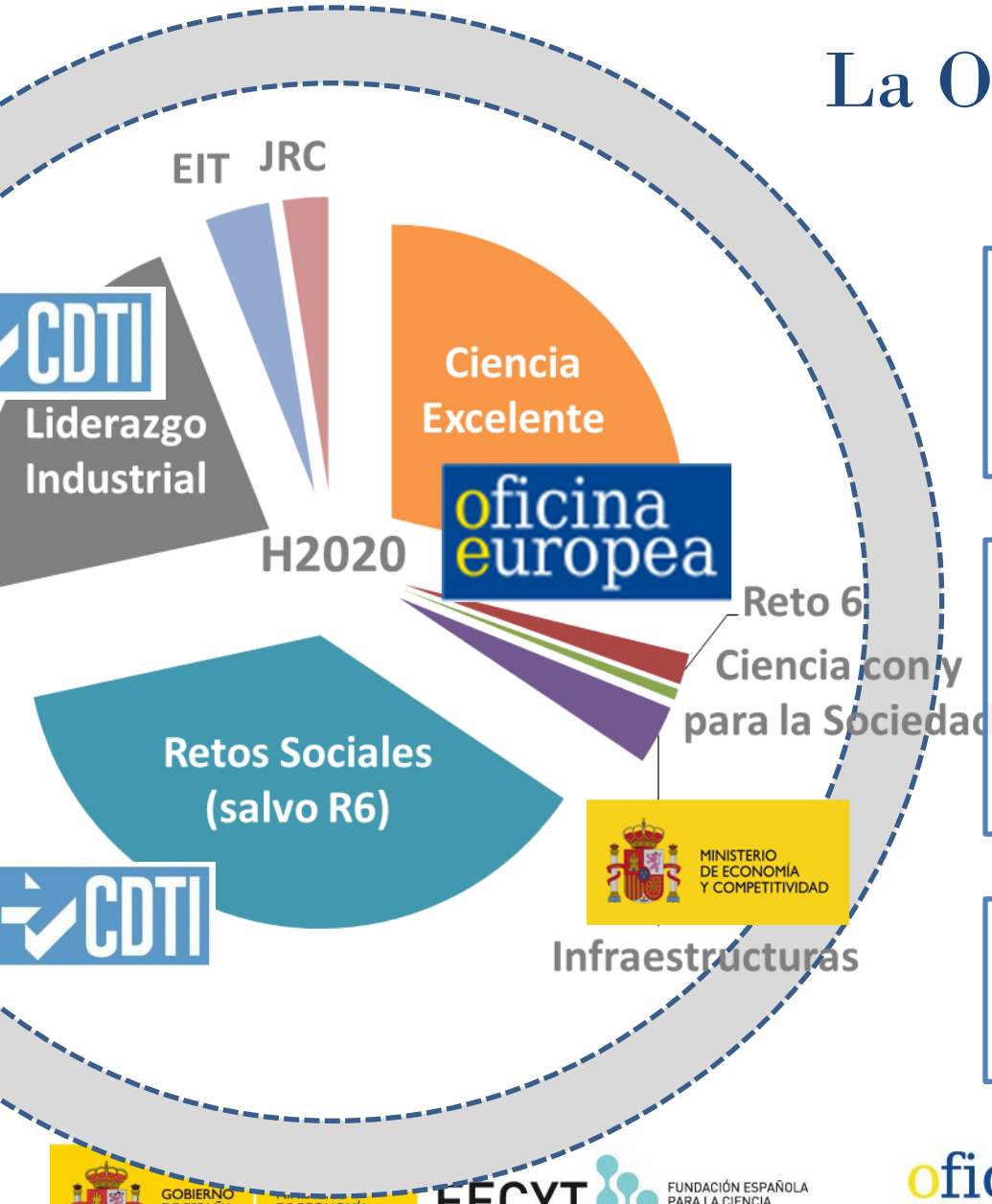
La OFICINA EUROPEA



Objetive

- Promote the participation and leadership of Spanish R&I centres in H2020.

Areas

- EXCELLENT SCIENCE: ERC, FET & MSCA
- SWAFS
- Challenge 6
- COST

Target group

- OPIs, Universities, public R&I institutions

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Contacto NCPs

Listas de distribución

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¡MUCHAS GRACIAS!

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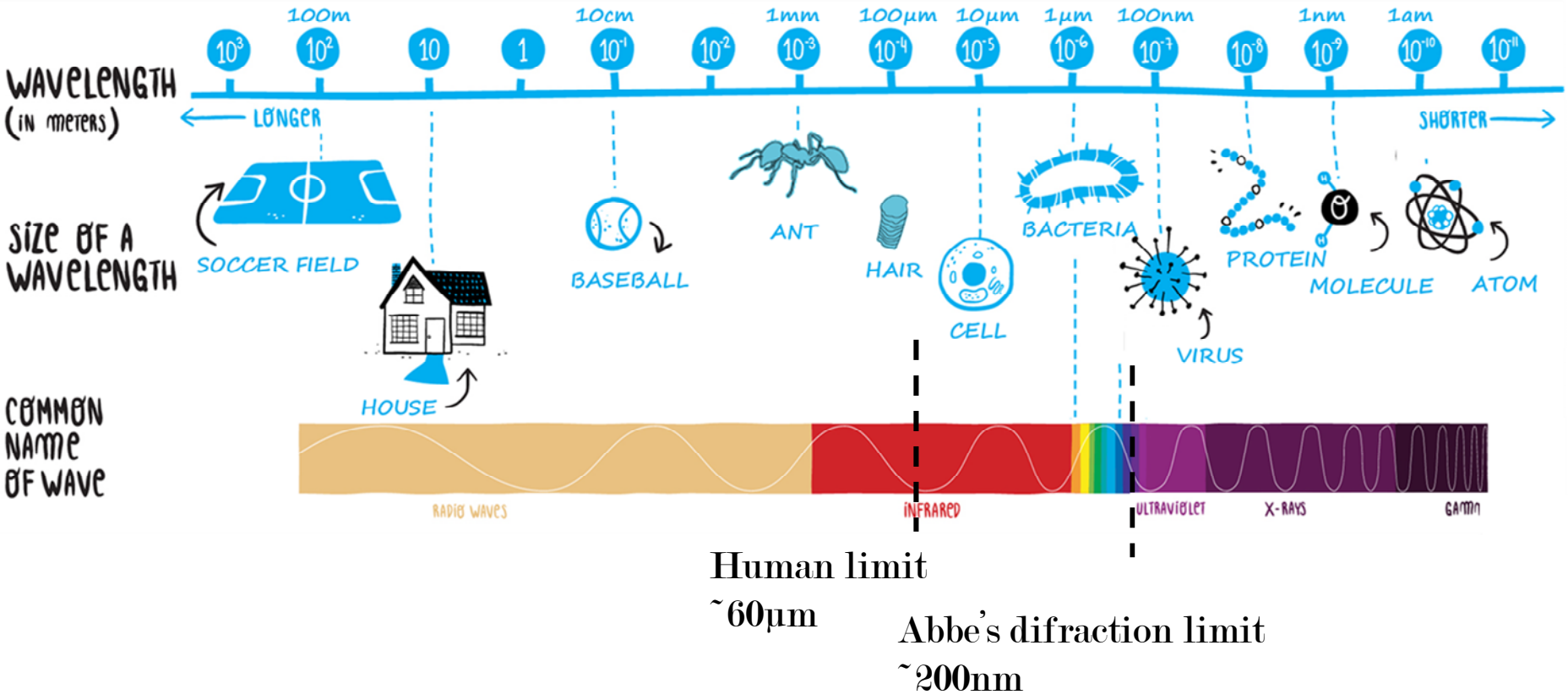
Project Details

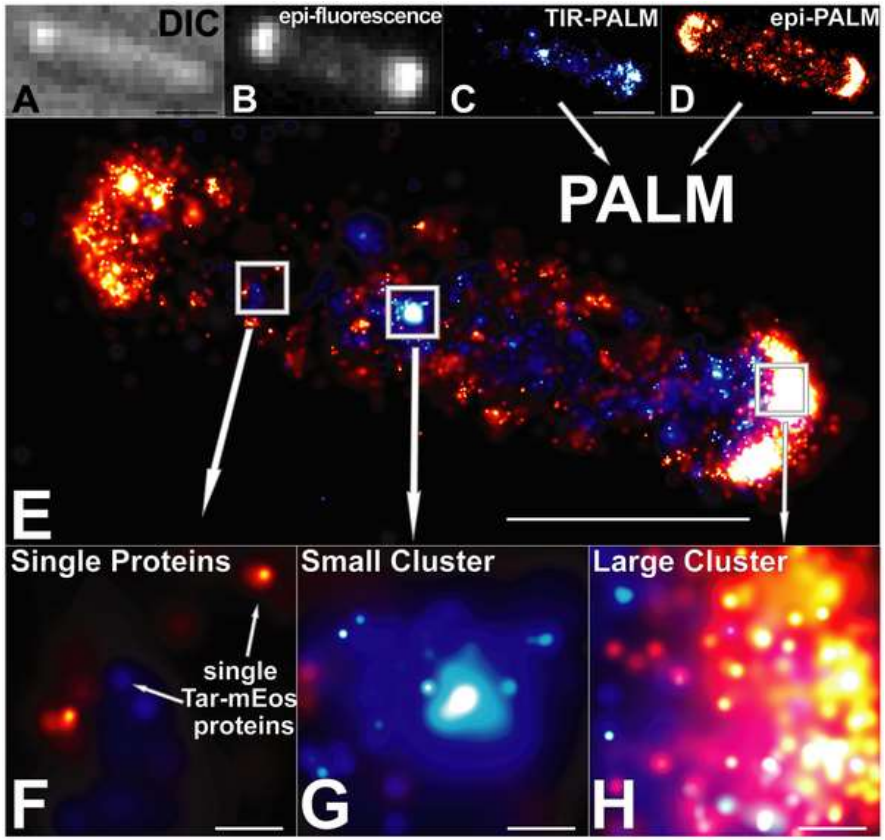
FULL TITLE
Overcoming the Limits of Diffraction with super-resolution Lighting on a Chip

DURATION
01.01.2017 - 31.12.2020

EU FUNDING
3.75 M€ by the European Union's Research Programme Horizon 2020, GA 737089

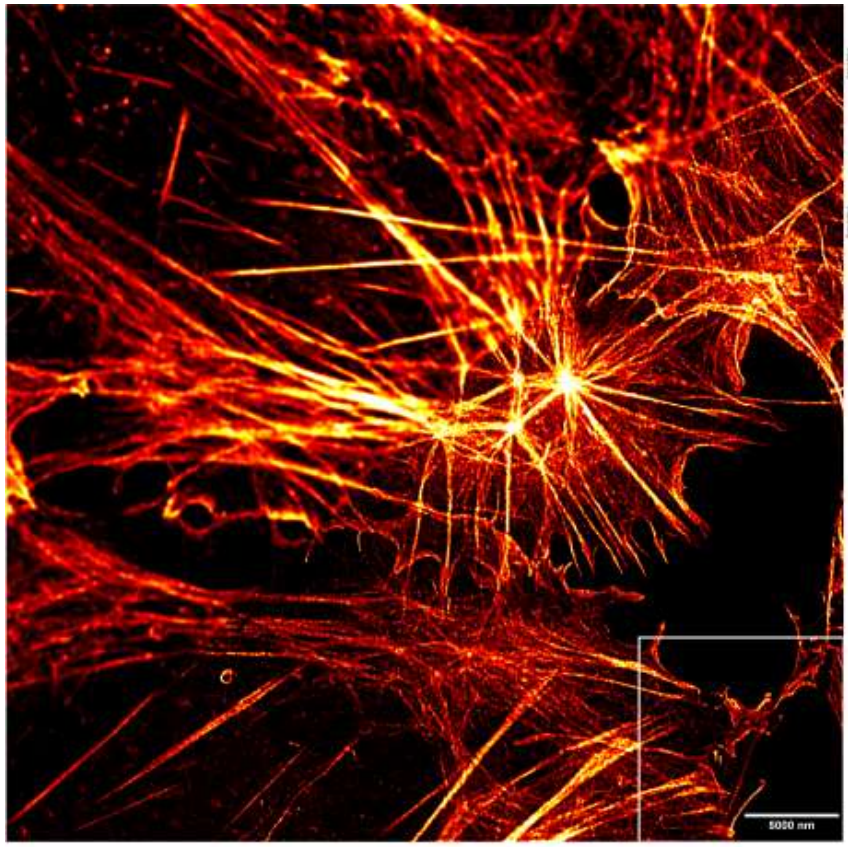


The resolution of an instrument is limited by the difraction of light



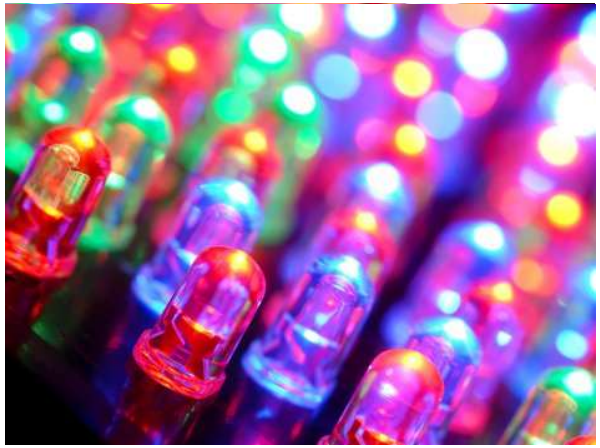
Stochastic optical reconstruction microscopy (STORM)

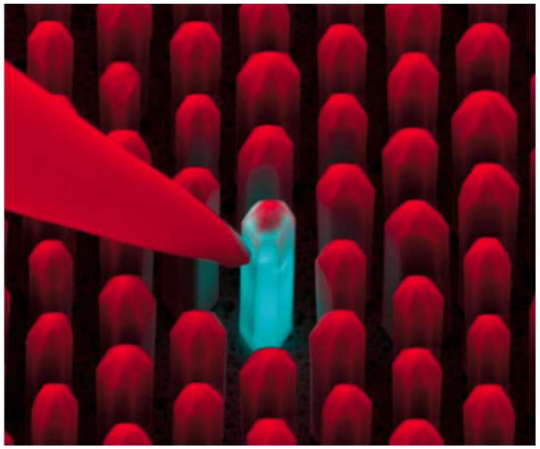
Photo activated localization microscopy (PALM)

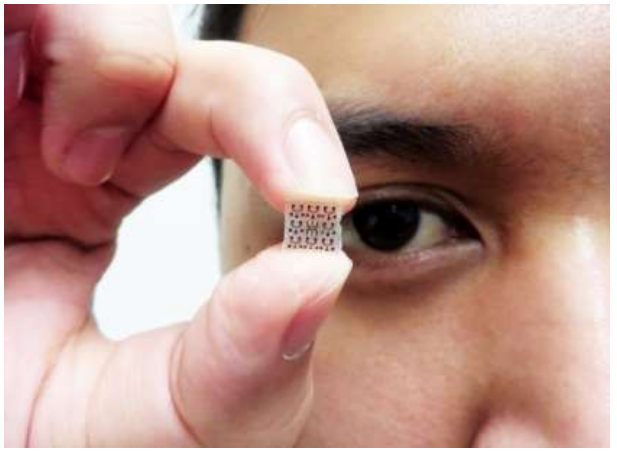


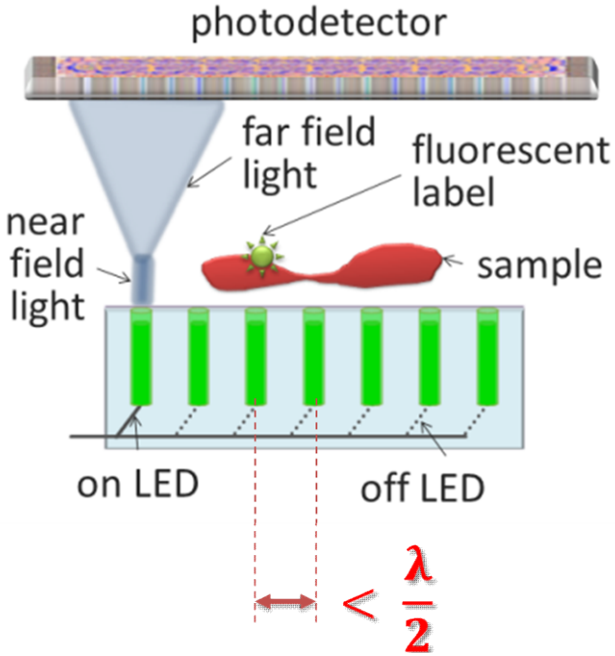
Stimulated emission depletion (STED) microscopy

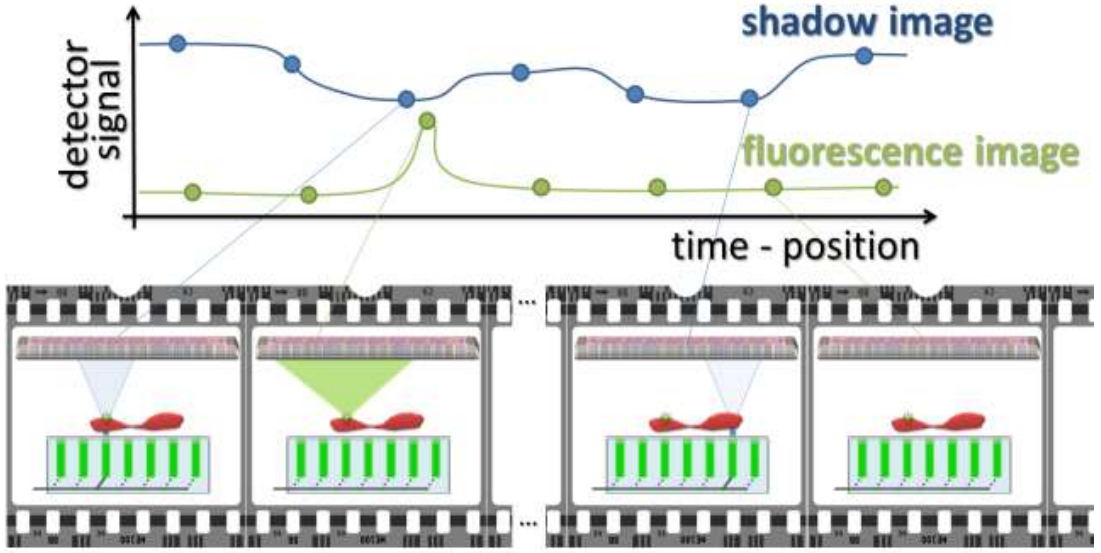
The idea








photodetector
far field light
fluorescent label
near field light
sample
on LED
off LED
$< \frac{\lambda}{2}$


detector signal
shadow image
fluorescence image
time - position

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Strengths

CHIPSCOPE

- Call: H2020-FETOPEN-2014-2015-RIA

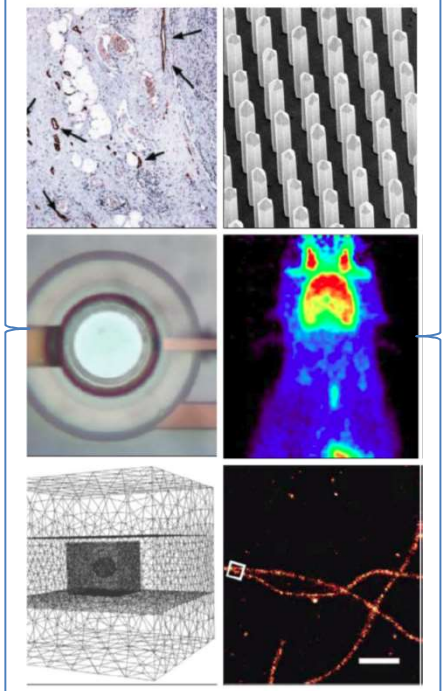
  *"FET Open supports the **early-stages of the science and technology** research and innovation around **new ideas** towards radically **new future technologies**."*

- Some attempts …
  - FETOPEN-1-2014 (September 2014) → 4.50/5.00
  - FETOPEN-2-2014-2015 (March 2015) → 4.85/5.00
  - FETOPEN-3-2014-2015 (September 2015) → 4.50/5.00
  - FETOPEN-1-2016-2017 (March 2016) → 4.90/5.00

- Strengths
  - Great **consortium!**
  - Specific, incremental, **intermediate goals**
  - Focused demonstration **application**
  - Participation of industry: **SME** + **Industry Advisory Board**
  - Particular attention to **Dissemination and Training**

Consortium

Universitat de Barcelona	CMOS Avalanche Photodiodes
Technische Universität Braunschweig	NanoLED arrays DNA nanorulers
Austrian Institute of Technology	Microsystems for life sciences
University of Rome	Multiphysics simulations
ExpertYmaging SL	Image proc. and reconstruction
Medizinische Universität Wien	Tissues for intra-cell structure obs.
Swiss Foundation for Research in Microtechnology	Dissemination and Training

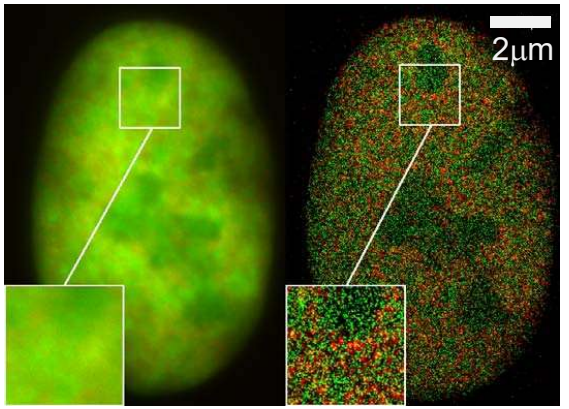


The future

- An optical microscope on a chip …

- … with superresolution capabilities

$$\textbf{feature size} < \frac{\lambda}{2}$$



Coordinator / Contact

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