AMaTUC

European project
on Additive Manufacturing

The importance of AM research and innovation in H2020 programme

The AMaTUC project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691787

Additive Manufacturing in EC's funding Programmes

- European Commission (EC) is supporting research, technological development and innovation in different S&T domains.
- As Additive Manufacturing is getting more and more popular, the EC is promoting the development of this technology and all the research activities gravitating around this topic.
- In the current H2020 Programme (2014-2020) AM is well represented and we are already witnessing an increase of European RDI projects in this field.

History of AM in EC's funding Programme

- Horizon 2020 is the 8th edition of the European Framework Programme for Research and Technological Development (FP).

Framework Programme	Period	Budget
FP1	1984–1987	3.8
FP2	1987–1990	5.4
FP3	1990–1994	6.6
FP4	1994–1998	13.2

Framework Programme	Period	Budget
FP5	1998–2002	15.0
FP6	2002–2006	17.9
FP7	2007–2013	50.5
H2020	2014–2020	78.6

History of AM in EC's funding Programme

- No electronic documents related to AM projects in the 1st FP Programmes, but the following information were found:
  - **"The EC provided funds since FP1 Programme, e.g. rapid prototyping with laser scanning of polymers."**

    Additive Manufacturing and 3D-Printing Technologies in the EC; France; January 2016; Germán ESTEBAN MUÑIZ; DG Research and Innovation.
  - **"88 projects were funded by the EC's FP Programmes: from FP3 to FP7 (1991-2013)."**

    "Additive Manufacturing in FP7 and Horizon 2020 - Report from the EC Workshop on Additive Manufacturing"; June 2014; DG Research and Innovation.

History of AM in EC's funding Programme

EC Programme	N° of Projects
FP3	4
FP4	8
FP5	3
FP6	12
FP7 IDEAS IRC	3
FP7 NMP	34
FP7 ICT	2
FP7 PEOPLE	8

EC Programme	N° of Projects
FP7 SME	5
FP7 TRANSP	1
FP7 INCO	1
FP7 JTI	5
FP7 KBBE	1
FP7 SIS	1
TOTAL	88

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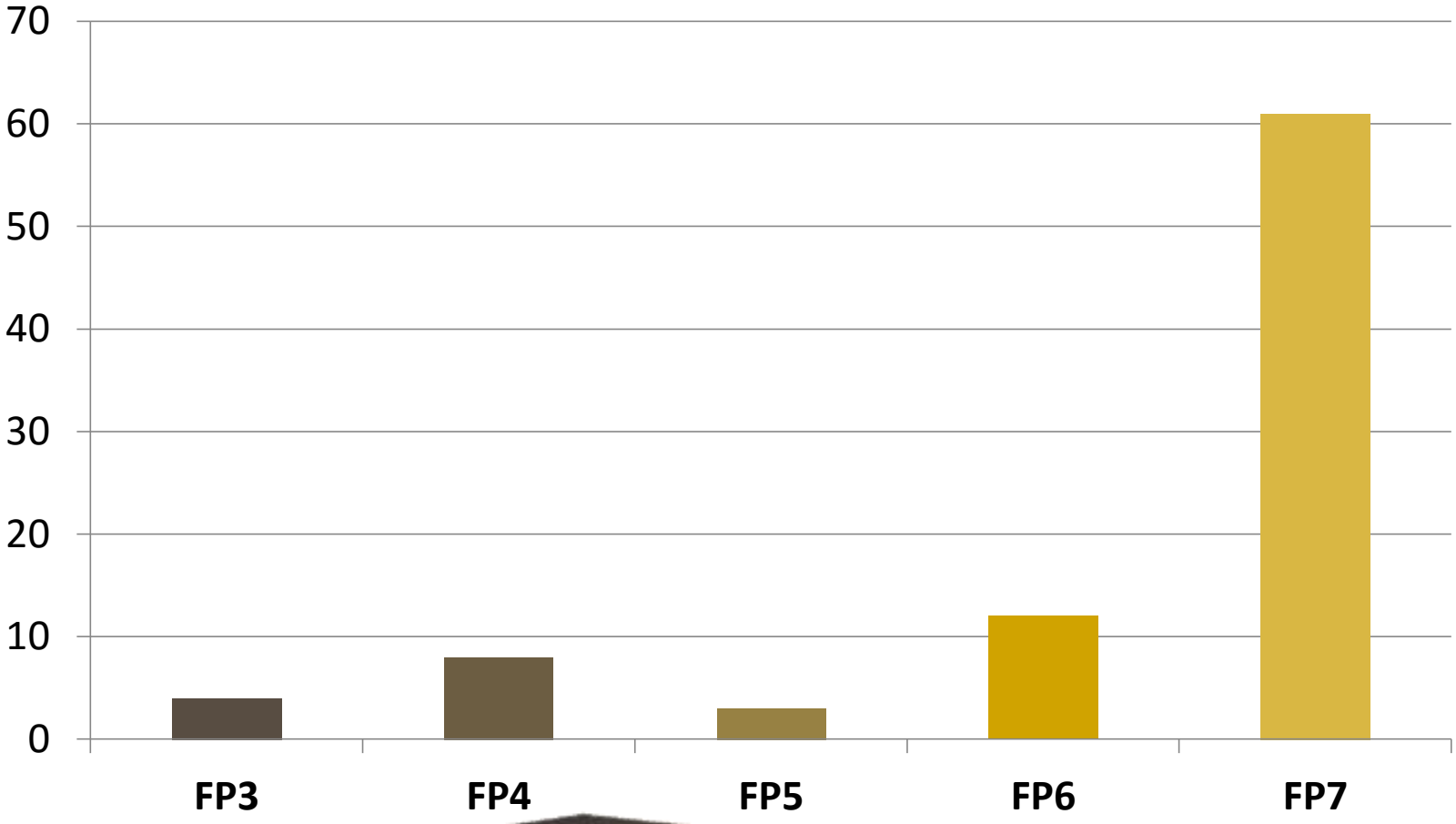
History of AM in EC's funding Programme



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History of AM in EC's funding Programme

- These 88 projects are focusing on different aspect of AM and divided as follow:
  - **Materials (29.6%):** metals (11.3%), polymer (7%), Ceramics (2.8%), and other materials (2.8%);
  - **Technologies (34.5%):** Process technologies (23.2%), Informatics (10.6%), Standardisation (0.7%);
  - **Applications (35.9%):**
  - Health (4.9%) Bio-printing (4.9%), Aerospace (3.5%), Moulds and tools (3.5%), Micro 3D-Printing (2.8%), Foot and textile (2.1%), Consumer goods (1.4%), Electronics (1.4%), Skills and education (1.4%), Microfluidics (0.7%), Design (0.7%), Food (0.7%).

How AM is represented in H2020 Programme?

- Specific calls for proposals targetting AM or highly relevant to AM technologies.
- List of H2020 funded projects related to AM.
- Key European platforms and initiatives supporting AM research and innovation.

Specific H2020 calls for proposals

- The H2020 Work Programmes 2014-2015 and the Work Programmes 2016-2017 are clearly specifying or somehow targeting Additive Manufacturing as a topic of interest.
  - *Public Private Partnership – FoF: Factories of the Future*
  - *LEIT – NMP: Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing.*
  - *LEIT - Information and Communication Technologies*
  - *LEIT – Space*
  - *Societal Challenge: Smart, green and integrated transport*

Factories of the Future (FoF)

- The Factories of the Future Public-Private Partnership (PPP) initiative aims at helping EU manufacturing enterprises, in particular SMEs, to adapt to global competitive pressures by developing the necessary key enabling technologies to support EU manufacturing across a broad range of sectors.
  - *FoF 2 – 2014: Manufacturing processes for complex structures and geometries with efficient use of material*
  - *FoF 8 – 2015: ICT-enabled modelling, simulation, analytics and forecasting technologies*
  - *FoF 10 – 2015: Manufacturing of custom made parts for personalised products*
  - *FOF-01-2016: Novel hybrid approaches for additive and subtractive manufacturing machines*

Factories of the Future (FoF)

- **FoF 10–2015: Manufacturing of custom made parts for personalised products**
  - Development and integration of advanced design and manufacturing technologies able to transform such new product-service data descriptions and protocols into manufacturing operations and processes exploiting.
  - Development of new machines and processes integrating advanced materials for the manufacturing of personalised parts and products.
  - Seamless data integration across the process and supply chains for the fast production and distribution of custom made parts and products.
  - Methodologies and tools for the management and running of effective value chains for the fast production and delivery of personalised products.

LEIT-NMP

- LEIT-NMP covers various field of S&T: Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing.
  - *NMP 7 – 2015: Additive manufacturing for table-top nanofactories*
  - *NMP 18 – 2014: Materials solutions for use in the creative industry sector*
  - *NMP 35 – 2014: Business models with new supply chains for sustainable customer-driven small series production*
  - *NMBP-37-2017: Mapping a path to future supply chains*

LEIT-NMP

- **NMP-07-2015 - Additive manufacturing for tabletop nanofactories**

  As a part of a wider initiative towards nano-manufacturing, the objective of this topic is to advance the state-of-the art of AM materials through modification of their fundamental material properties using nanotechnology and to develop novel additive manufacturing techniques that incorporate new functionalities and/or significant performance increase, e.g. by utilising printable high-strength materials in the manufactured components. For example, carbon nanotube or other functional nano-structures could be embedded and combined with the printing process to perform electronic functions such as sensing and communications, or bio materials, such as flexible polymers or ceramics could be used to create bio-inspired structures.

Analysis of H2020 Projects

- An in-depth analysis of 'already funded' H2020 projects related to AM has been made on Cordis database (August 2016).
  - *Programme: H2020* / 'additive manufacturing'*
  - *Programme: H2020* / '3D printing'*
  - *Programme: H2020* / '3D manufactur-'*
- Relevant information have been collected:
  - *Project title*
  - *Start and end dates*
  - *Call for proposal*
  - *Funding scheme*
  - *Financial data (total cost & EU contribution)*

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Free text

Latest Results in Brief

New insights into the development of the sense of self

2016-08-18

A team of EU researchers has provided novel insights into the mechanisms supporting an essentially human sense: the sense of self. Investigations centred on the cognitive, affective, neural and developmental basis of the human self, with important results for enhancing literac...

The climate implications of sea ice

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Les informations sur les projets et maintenant aussi les résumés de rapports **Horizon 2020** sont disponibles sur CORDIS. Tous les projets H2020 peuvent être téléchargés depuis le Portail des données ouvertes de l'UE.

'additive manufacturing' AND (programme/code='H2020-*') AND contenttype='project'

Results 1 - 10 of 29

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My refinements

Terme de recherche:
additive manufacturing

Programme:
H2020-*

Type de contenu:
Projet

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Affiner par:

- Pays
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Recherche avancée

[PROJET] **INTENT** - Structured Reactors with INTensified ENergy Transfer for Breakthrough Catalytic Technologies
Ref.: 694910
Date de début: 2016-11-01, **Date de fin:** 2021-10-31
Critically important heterogeneous catalytic reactions for energy conversion and chemicals production have been run for several decades in fixed bed reactors randomly packed with catalyst pellets, whose operation is intrinsically limited by slow heat removal/supply. There is...
Programme: H2020-EU.1.1.
Record Number: 204852
Last updated on: 2016-08-05
Booklet

[PROJET] **ToMax** - Toolless Manufacturing of Complex Structures
Ref.: 633192
Date de début: 2015-01-01, **Date de fin:** 2017-12-31
Lithography based additive manufacturing technologies (L-AMT) are capable of fabricating parts with excellent surface quality, good feature resolution and precision. ToMax aims at developing integrated lithography-based additive manufacturing systems for the fabrication of...
Programme: H2020-EU.2.1.5.
Record Number: 193185
Last updated on: 2016-07-28
Booklet

[PROJET] **ICARUS** - Towards Innovative cost-effective astronomical instrumentation
Ref.: 678777

Analysis of H2020 Projects

- A total of 70 projects have been identified based on the selected keywords.
- AM is not always the main topic of the projects but it is always stated in the project abstract.
  - *Sometimes AM is used as a support tool for the Action <u>OR</u> it is a possible application for the research/innovation outcomes.*
- The H2020 budget dedicated to these 70 projects is quite significant and we noticed a tremendous interest of the EC compared to FP7 Programme.

Analysis of H2020 Projects

- In the report "Additive Manufacturing in FP7 and Horizon 2020 - Report from the EC Workshop on Additive Manufacturing", the DG Research and Innovation is stating that:
  - *"During FP7 (2007-2013), the more than 60 successful projects based on AM technologies received a total EC funding contribution of over €160 million, with an overall total budget of €225 million".*
- The recent analysis of H2020 projects related to AM is covering the period 2014-2016 (with some limitations) and already reach the investment made by the EC during the FP7 Programme:
  - *Overall Total Budget: 200 780 408,68 Euro*
  - *EU Contribution: 148 075 760,68 Euro*

Limitations of the analysis

- The limitations of the analysis are due to the following factors:
  - *Limited number of keywords used to identify the projects;*
  - *Delay in publishing information on the funded projects on Cordis database;*
  - *Specific calls have deadlines next year (FoF-12-2017);*
  - *Specific calls had deadlines in early 2016 and selected projects are under negotiation (FoF-01-2016 and FoF-05-2016);*
- Consequently the current analysis is only covering the period 2014-2015 (except for 4 SME instrument projects)

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Interesting facts from the analysis of AM projects funded under H2020 Programme

European Research Council

- The European Research Council supports frontier research, cross disciplinary proposals and pioneering ideas in new and emerging fields which introduce unconventional and innovative approaches.
- ERC has different funding schemes:
  - ***ERC Starting Grant*** *for young, early-career top researchers (2-7 years after PhD).*
  - ***ERC Consolidator Grant*** *for already independent excellent researchers 7-12 years after PhD).*
  - ***ERC Advanced Grant*** *for senior research leaders with significant research achievements in the last 10 years.*
  - ***ERC Proof of Concept Grant*** *for ERC grant holders who want to check the market and/or innovation potential of research results.*

European Research Council

- Additive Manufacturing is well represented in the ERC sub-programme with 21 projects out of 70 (30%).
  - *5 Starting Grants (3 in the call 2014 and 2 in the call 2015)*
  - *4 Consolidator Grants (2 in the call 2014 and 2 in the call 2015)*
  - *8 Advanced Grants (4 in the call 2014 and 4 in the call 2015)*
  - *4 Proof of Concept Grants (2 in the call 2014 and 2 in the call 2015)*

Marie Skłodowska-Curie actions

- The Marie Skłodowska-Curie actions (MSCA) provide grants for all stages of researchers' careers - be they doctoral candidates or highly experienced researchers - and encourage transnational, intersectoral and interdisciplinary mobility.
  - ***Individual fellowships*** *(IF): support for experienced researchers undertaking mobility between countries.*
  - *Research networks (ITN): support for* ***Innovative Training Networks.***
  - ***International and inter-sectoral cooperation*** *through the Research and Innovation Staff Exchanges (RISE).*

Marie Skłodowska-Curie actions

- The MSCA sub-programme already financed 8 projects related to Additive Manufacturing (11.4%).
  - *6 MSCA-IF projects (5 'European Fellowship' projects and 1 'Global Fellowship' project)*
  - *1 MSCA-ITN project*
  - *1 MSCA-RISE project*

Spreading Excellence and Widening Participation

- Maximising investment in research and innovation will enable the European Research Area to function in a more streamlined and homogeneous way, allowing the individual strengths of each Member State to be optimised.
  - ***Teaming****: associating advanced research institutions to other institutions, agencies or regions for the creation or upgrade of existing centres*
  - ***Twinning*** *will help strengthen a defined field of research in a knowledge institution through linking with at least two internationally-leading counterparts in Europe.*

Spreading Excellence and Widening Participation

- 2 Teaming project (Phase 1) and 1 Twinning project.
  - *WCE - Wroclaw Centre of Excellence: Focus on new materials, nanophotonics, additive laser-based technologies and new management organisation systems.*
  - *NANOMATCON - Multifunctional Nanoparticles and Materials Controlled by Structure: Focus on nanomaterials and engineering technologies by integrating multiscaled 3D-printing machines combined with wet nanochemistry robotics.*

Spreading Excellence and Widening Participation

- The evaluation results of Teaming (Phase 2) proposals will be publically available in early 2017.
- If the AM related Teaming projects are successful it is worth initiating the contact with the new Centres of Excellence.
  - *Identification of mutual research interests and development of synergies.*
  - *Big investment in infrastructure and research capacities: 15m€ from H2020 and at least 15m€ from other financing source(s).*
- Idem for the project: [M-ERA.NET 2 - ERA-NET for materials research and innovation]

Research OR Innovation projects?!

- The EC funded:
  - *17 Research and Innovation Action projects (24,3%)*
  - *3 Innovation Action projects (4,3%)*

- So far the EC mainly invested in research projects instead of technology development and innovation projects.
- All these projects were funded under specific H2020 calls targeting AM.
- Hoping that the forthcoming H2020 Work Programmes 2018-2019 will intensify their focus on Innovation projects.

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Thank you for your attention

intelligentsia
consultants

Flavien Massi - *Intelligentsia Consultants Sàrl*

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List of H2020 projects related to AM research and innovation

(September 2016)

Flavien Massi - *Intelligentsia Consultants Sàrl*

intelligentsia consultants

Title & Hyperlink	Start date	End date	Programme	Funding Scheme	Total costs	EU contribution	Coordinator	Project Description
WCE - Wroclaw Centre of Excellence	01/06/2015	31/05/2016	WIDESPREAD-1-2014 - Teaming	CSA	495100	495100	NARODOWE CENTRUM BADAN I ROZWOJU (Poland)	The objective of the proposal is to form Wroclaw Centre of Excellence (WCE), by a close collaboration of Wroclaw University of Technology with National Centre for Research and Development, and German partners - Fraunhofer Institute for Material and Beam Technology in Dresden and University of Würzburg. A special focus will be put on new materials, nanophotonics, additive laser-based technologies and new management organisation systems.
AMaTUC - Boosting the scientific excellence and innovation capacity in additive manufacturing of the Technical University of Cluj-Napoca	01/01/2016	31/12/2018	H2020-TWINN-2015 - Twinning	CSA	999444	999444	UNIVERSITATEA TEHNICA CLUJ-NAPOCA (Romania)	The overall aim of the AMaTUC project is to boost the scientific excellence and innovation capacity in additive manufacturing of the Technical University of Cluj-Napoca (TUCN) and its high-quality Twinning partners for the benefit of the automotive industry and personalised products markets.
FoFAM - Industrial and regional valorization of FoF Additive Manufacturing Projects	01/01/2015	31/12/2016	FoF-07-2014 - Support for the enhancement of the impact of FoF PPP projects	CSA	348210	348210	FUNDACION PRODINTEC (Spain)	FoFAM project takes up the challenge of clustering technology developments on AM and place them into defined value chains in lead markets for Europe. The project intends to identify gaps for business development and to attack them with specific actions and timeline. It also includes high involvement of European regions to ensure an efficient use of structural funds associated to them. FoFAM also address not only technological aspects but also aims at identifying other horizontal economical and societal issues that will be taken into consideration to ensure AM industrial deployment.
SMART-map - RoadMAPs to Societal Mobilisation for the Advancement of Responsible Industrial Technologies	01/05/2016	31/10/2018	GARRI-2-2015 - Responsible Research and Innovation in industrial context	CSA	1515636	1515636	AARHUS UNIVERSITET (Denmark)	The aim of SMART-map is to connect a wide range of industrial players with actors from research and civil society organisations and establish innovative formats of collaboration to jointly discuss, define and implement concrete roadmaps (SMART Maps) for the responsible development of technologies and services in three key time-changing fields. Based on the Societal Challenges of Horizon2020, SMART-map will address the areas of precision medicine, 3D printing in the biomedical field, and synthetic biology.
NANOMATCON - Multifunctional Nanoparticles and Materials Controlled by Structure	01/06/2015	31/05/2016	WIDESPREAD-1-2014 - Teaming	CSA	321041	321041	TECHNICKA UNIVERZITA V LIBERCI (Czech Republic)	Multiscaled structure-tuned materials with exactly predefined hierarchical architectures composed of multifunctional nanoparticles represent a class of the most advanced future materials for applications in nanobiotechnology, nanomedicine, lighting technologies, green energy resources as well as in military and security branches. The CxI Centre in Liberec will expand its current activities in the field of nanomaterials and engineering technologies by integrating multiscaled 3D-printing machines combined with wet nanochemistry robotics in order to create the aforementioned breakthrough materials. These activities fully correspond to the agenda defined in Horizon 2020. The project belongs to the CEP themes of composite materials (JI), biotechnology (EI) and non-nuclear energy, consumption and utilization of energy (JE).
M-ERA.NET 2 - ERA-NET for materials research and innovation	01/03/2016	28/02/2021	NMP-14-2015 - ERA-NET on Materials (including Materials for Energy)	ERA-NET-Cofund	49687954	12750000	OESTERREICHISCHE FORSCHUNGSFOERDERUNGSGESELLSCHAFT MBH (Austria)	M-ERA.NET 2 aims at coordinating the research efforts of the participating EU Member States, Associated States and Regions as well as of selected global partners in materials research and innovation, including materials for low carbon energy technologies and related production technologies. Continuing the activities started under the predecessor project M-ERA.NET (2/2012-1/2016), the M-ERA.NET 2 consortium will support relevant thematic areas, such as -for example- surfaces, coatings, composites, additive manufacturing or computational materials engineering.
ULTRASUPERTAPE - ULTRAfast growth of ultrahigh performance SUPERconducting TAPEs	01/12/2015	30/11/2020	ERC-ADG-2014 - ERC Advanced Grant	ERC	2496652	2496652	AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS (Spain)	ULTRASUPERTAPE aims to demonstrate an unprecedented approach for fabrication of low cost / high throughput / high performance High Temperature Superconducting (HTS) tapes, or Coated Conductors, to push the emerging HTS industry to market. The breakthrough idea is the use of Transient Liquid Assisted Growth from low cost Chemical Solution Deposition of Y, Ba, Cu metallorganic precursors to reach ultrafast growth rates. Innovative Additive Manufacturing and Digital Printing methodologies are identified to devise an integrated system able to address the full manufacturing process from solution deposition by ink jet printing to ultrafast epitaxial crystallization of the superconducting phase.
SORBET - Spin Orbitronics for Electronic Technologies	01/11/2015	31/10/2020	ERC-ADG-2014 - ERC Advanced Grant	ERC	2750000	2750000	MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN EV (Germany)	SORBET is focussed on an emerging sub-field of spintronics, namely that of spin orbitronics. Recent discoveries in this field concern the interplay of several distinct spin orbit coupling derived phenomena that, together, allow for the highly efficient current induced motion of domain walls (DWs) in magnetic nanowires. Novel methods to fabricate these devices will be explored, especially, the use of atomic layer deposition and 3D printing techniques.
VESCEL - Vascular Engineering on chip using differentiated Stem Cells	01/10/2015	30/09/2020	ERC-ADG-2014 - ERC Advanced Grant	ERC	2250000	2250000	UNIVERSITEIT TWENTE (Netherlands)	Organs-on-chip hold great promise for the creation of complex and realistic disease models while having the potential to refine, reduce and (partly) replace existing animal models (3R principle). Of all organs, vasculature is extremely well-suited to realize on-chip since it pervades the whole organism, is present in all other organs, its malfunctioning plays a role in many diseases and finally is ideally suited to approach with microfabrication and microfluidic technologies. In the VESCEL program we propose the development of innovative technologies enabling the use of differentiated human induced pluripotent stem cells (hiPSC) to engineer blood vessels on chip that constitute realistic disease models for thrombosis and neurodegenerative (ND) diseases. We will also develop a new flexible technology for real 3D vasculature realization using advanced 3D printing technologies.

Lattice Cage - Titanium based Cervical Spine Implants manufactured using 3D laser sintering to produce a structure optimised for graft-free bone in-growth	01/01/2016	31/12/2020	ERC-ADG-2014 - ERC Advanced Grant	ERC	2499870	2499870	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF CAMBRIDGE (UK)	A systematic procedure for generating multi-phase lattice materials - MULTILAT - will be developed by micro-architectural design, in order to fill gaps in material property space. New engineering devices and products frequently require materials with extreme properties, such as high strength and toughness at low density, and a systematic means of material invention is needed. This proposal breaks much ground in developing new fundamental concepts, ranging from micro-architectured surface coatings to inter-penetrating bulk lattices of dissimilar materials. The focus will be on 2 inter-penetrating lattices, but the topology of each can range from 1D fibres, through 2D meshes to 3D lattices and foams. A focus will be lightweight strong and tough lattices, and surface lattices (as coatings).
INTENT - Structured Reactors with INTensified ENergy Transfer for Breakthrough Catalytic Technologies	01/11/2016	31/10/2021	ERC-ADG-2015 - ERC Advanced Grant	ERC	2484649	2484648	POLITECNICO DI MILANO (Italy)	catalytic reactions for energy conversion and chemicals production, I propose that a game-changing alternative is provided by structured reactors wherein the catalyst is washcoated onto or packed into structured substrates, like honeycomb monoliths, open-cell foams or other cellular materials, fabricated with highly conductive metallic (Al, Cu) materials. The goal of this project is to fully elucidate fundamental and engineering properties of such novel conductive structured catalysts, investigate new concepts for their design, manufacturing, catalytic activation and operation (e.g. 3D printing, packed foams, energy supply by solar irradiation), and demonstrate their potential for a quantum leap in the intensification of three crucial catalytic processes for the production of energy vectors,
NANOFACTORY - Building tomorrow's nanofactory	01/09/2016	31/08/2021	ERC-ADG-2015 - ERC Advanced Grant	ERC	2488190	2488190	ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE (Switzerland)	The aim of this project is to translate the concept of production line to the nanoworld to develop what could become tomorrow's nanofactory. The foreseen research is very comprehensive, including modelling, nanofabrication and explorations at the nanoscale. This ground-braking proposal will demonstrate how additive manufacturing can be implemented at the nanoscale.
MILEPOST - Microscale Processes Governing Global Sustainability	01/09/2016	31/08/2021	ERC-ADG-2015 - ERC Advanced Grant	ERC	2810198	2810198	HERIOT-WATT UNIVERSITY (UK)	The ambition is to progress beyond the state of the art via additive manufacturing tools to print 3D replicas of porous cores that enable monitoring the properties within the pores. Our unique approach is to develop for the first time three-dimensional instrumented replicas of porous structures, so we can gain much needed dynamic data at the pore scale that can be incorporated into validated simulations coupling flow and reactive transport processes
SmartCast - Smart casting of concrete structures by active control of rheology	01/10/2016	30/09/2021	ERC-ADG-2015 - ERC Advanced Grant	ERC	2498750	2498750	UNIVERSITEIT GENT (Belgium)	SmartCast proposes a new concrete casting concept to transform the concrete industry into a highly automated technological industry. Currently, the rheological properties of the concrete are defined by mix design and mixing procedure without any further active adjustment during casting. The goal of this proposal is the active control of concrete rheology during casting, and the active triggering of early stiffening of the concrete as soon as it is put in place. The developed active rheology control will provide a fundamental basis for the development of future-proof 3D printing techniques in concrete industry.
JointPrinting - 3D Printing of Cell Laden Biomimetic Materials and Biomolecules for Joint Regeneration	01/09/2015	31/08/2020	ERC-CoG-2014 - ERC Consolidator Grant	ERC	1999700	1999700	THE PROVOST FELLOWS & SCHOLARS OF THE COLLEGE OF THE HOLY AND UNDIVIDED TRINITY OF QUEEN ELIZABETH NEAR DUBLIN (Ireland)	Osteoarthritis (OA) is a serious disease of the joints affecting nearly 10% of the population worldwide. Realising an efficacious therapeutic solution for treating OA remains one of the greatest challenges in the field of orthopaedic medicine. This proposal envisions a future where 3D bioprinting systems located in hospitals will provide 'off-the-shelf', patient-specific biological implants to treat diseases such as OA. To realise this vision, this project will use 3D bioprinting to generate anatomically accurate, biomimetic constructs that can be used to regenerate both the cartilage and bone in a diseased joint.
3D-JOINT - 3D Bioprinting of JOINT Replacements	01/07/2015	30/06/2020	ERC-CoG-2014 - ERC Consolidator Grant	ERC	1998871	1998871	UNIVERSITAIR MEDISCH CENTRUM UTRECHT (Netherlands)	The world has a significant medical challenge in repairing injured or diseased joints. (3D) bio-printing provides a greatly controlled placement and organization of living constructs through the layer-by-layer deposition of materials and cells. These tissue constructs can be applied as tissue models for research and screening. However, the lack of biomechanical properties of these tissue constructs has hampered their application to the regeneration of damaged, degenerated or diseased tissue.I have pioneered a 3D bio-printing technology that combines accurately printed small diameter thermoplast filaments with cell invasive hydrogels to form strong fibre-reinforced constructs. This, in combination with bioreactor technology, is the key to the generation of larger, complex tissue constructs with cartilage-like biomechanical resilience. With 3D-JOINT I will use my in-depth bio-printing and bioreactor knowledge and experience to develop a multi-phasic 3D-printed biological replacement of the joint.
xPRINT - 4-Dimensional printing for adaptive optoelectronic components	01/09/2016	31/08/2021	ERC-CoG-2015 - ERC Consolidator Grant	ERC	1993908	1993908	CONSIGLIO NAZIONALE DELLE RICERCHE (Italy)	This project aims at developing four-dimensional printing of new adaptive systems, namely printing of complex, three-dimensional polymer objects embedding functional compounds and able to change or adapt their physical properties responding to environmental stimuli.

3D2DPrint - 3D Printing of Novel 2D Nanomaterials: Adding Advanced 2D Functionalities to Revolutionary Tailored 3D Manufacturing	01/10/2016	30/09/2021	ERC-CoG-2015 - ERC Consolidator Grant	ERC	2499942	2499942	THE PROVOST FELLOWS & SCHOLARS OF THE COLLEGE OF THE HOLY AND UNDIVIDED TRINITY OF QUEEN ELIZABETH NEAR DUBLIN (Ireland)	My vision is to establish, within the framework of an ERC CoG, a multidisciplinary group which will work in concert towards pioneering the integration of novel 2-Dimensional nanomaterials with novel additive fabrication techniques to develop a unique class of energy storage devices. 3D2DPrint aims to develop micro-energy devices (both supercapacitors and batteries), technologies particularly relevant in the context of the emergent industry of micro-electro-mechanical systems and constantly downsized electronics. We plan to use novel two-dimensional (2D) nanomaterials obtained by liquid-phase exfoliation.
M3M - Mobile 3D Modeling	01/10/2015	31/03/2017	ERC-PoC-2014 - ERC Proof of Concept Grant	ERC	150000	150000	EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH (Switzerland)	The topic of this proposal is mobile 3D modeling. Building on top of 4DVideo results published at the latest International Conference on Computer Vision (ICCV2013), the goal of this proposal is to explore the commercial potential of enabling mobile 3D scanning with smart phones. Our algorithms allow to perform accurate 3D modeling from images at interactive rates on a smart phone (without requiring any additional sensors or a live data connection).Potential applications would be in the area of 3D authentication, 3D printing or medical diagnosis.
APPROAcH - APPROAcH: Antimicrobial and Save 3D-Printable Polymers for Oral Health	01/04/2016	30/09/2017	ERC-PoC-2014 - ERC Proof of Concept Grant	ERC	150000	150000	RIJKSUNIVERSITEIT GRONINGEN (Netherlands)	3DP enables a more patient specific way of working, increasing the quality of dental care on the one hand and reducing the costs on the other hand. To address both problems, a highly innovative 3DP antimicrobial polymer system for applications in dentistry and orthodontics will be developed in this proposal. Since the materials will be in contact to or incorporated into the body, attention needs to be paid to render these systems non-toxic and biocompatible. Second, the commercial, IPR and business opportunities of these novel materials will be investigated.
SMARTLENS - Reconfigurable smart lens for adaptive imaging	01/08/2015	31/01/2017	ERC-PoC-2015 - ERC Proof of Concept Grant	ERC	150000	150000	FUNDACIO INSTITUT DE CIENCIES FOTONIQUES (Spain)	Adaptive optical elements that enable dynamic control of optical paths are essential components of the last generation of commercial optical devices in a wide range of sectors, including smart phones, microscopy and 3D printing. The main goal of the SMARTLENS project is to exploit a recently developed technology to create a new paradigm in optical imaging by transforming at low cost any conventional static optical lens into an adaptive lens whose imaging properties can be dynamically shaped almost at will
IceXL - IceXL: Advanced modeling and slicing software for additive manufacturing	01/09/2016	28/02/2018	ERC-PoC-2015 - ERC Proof of Concept Grant	ERC	149750	149750	INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET EN AUTOMATIQUE (France)	The ICEXL proof of concept project targets the pre-commercialization of a novel software for additive manufacturing of complex technical parts. It relies on innovative approaches from the SHAPEFORGE project (Stg-2012-307877) and in particular our software prototype IceSL.
ThermoTex - Woven and 3D-Printed Thermoelectric Textiles	01/06/2015	31/05/2020	ERC-StG-2014 - ERC Starting Grant	ERC	1500000	1500000	CHALMERS TEKNISKA HOEGSKOLA AB (Sweden)	Current thermoelectric technologies rely on toxic inorganic materials that are both expensive to produce and fragile by design, which renders them unsuitable especially for wearable applications. Instead, in this programme we will use polymer semiconductors and nanocomposites. Initially, we will focus on the preparation of materials with a thermoelectric performance significantly beyond the state-of-the-art. Then, we will exploit the ease of shaping polymers into light-weight and flexible articles such as fibres, yarns and fabrics. We will explore both, traditional weaving methods as well as emerging 3D-printing techniques, in order to realise low-cost thermoelectric textiles.
EyeRegen - Engineering a scaffold based therapy for corneal regeneration	01/07/2015	30/06/2020	ERC-StG-2014 - ERC Starting Grant	ERC	1498734	1498734	THE PROVOST FELLOWS & SCHOLARS OF THE COLLEGE OF THE HOLY AND UNDIVIDED TRINITY OF QUEEN ELIZABETH NEAR DUBLIN (Ireland)	The aim of this project is to develop a new approach to corneal tissue regeneration. Previous approaches at engineering corneal tissue have required access to donor cells and lengthy culture periods in an attempt to grow tissue in vitro prior to implantation with only limited success and at great expense. Our approach will differ fundamentally from these in that we will design artificial corneal scaffolds that do not require donated cells or in vitro culture but instead will recruit the patient's own cells to regenerate the cornea post-implantation. Techniques such as 3D bio-printing and nanofiber electrospinning will be used to fabricate scaffolds. The ability of the scaffold to attract cells and promote matrix remodelling will be examined by developing an in vitro bioreactor system capable of mimicking the ocular environment and by performing in vivo tests using a live animal model.
GEM - From Geometry to Motion: inverse modeling of complex mechanical structures	01/09/2015	31/08/2020	ERC-StG-2014 - ERC Starting Grant	ERC	1498570	1498570	INSTITUT NATIONAL DE RECHERCHE ENINFORMATIQUE ET AUTOMATIQUE (France)	With the considerable advance of automatic image-based capture in Computer Vision and Computer Graphics these latest years, it becomes now affordable to acquire quickly and precisely the full 3D geometry of many mechanical objects featuring intricate shapes. The GEM challenge consists in developing a non-invasive method for inferring the mechanical properties of complex objects from a minimal set of geometrical poses, in order to predict their dynamics. In contrast to classical inverse reconstruction methods, my proposal is built upon the claim that 1/ the mere geometrical shape of physical objects reveals a lot about their underlying mechanical properties and 2/ this property can be fully leveraged for a wide range of objects featuring rich geometrical configurations, such as slender structures subject to frictional contact (e.g., folded cloth or twined filaments).

ICARUS - Towards Innovative cost-effective astronomical instrumentation	01/08/2016	31/07/2021	ERC-StG-2015 - ERC Starting Grant	ERC	1747667	1747667	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (France)	This proposal has the clear objective to propose breakthrough compact optical architectures for the next generation of giant observatories. The project focus on the niche of active components and is structured in two main research pillars to (I) enable the use of additive manufacturing (3D-printing) to produce affordable deformable mirrors for VIS or NIR observations, (II) pave the road for a common use of curved and deformable detectors. Extensive finite element analysis will allow to cover the parameter space and broad prototyping will demonstrate and characterize the performance of such devices.
BIO-ORIGAMI - Meta-biomaterials: 3D printing meets Origami	01/02/2016	31/01/2021	ERC-StG-2015 - ERC Starting Grant	ERC	1499600	1499600	TECHNISCHE UNIVERSITEIT DELFT (Netherlands)	Meta-materials, best known for their extraordinary properties (e.g. negative stiffness), are halfway from both materials and structures: their unusual properties are direct results of their complex 3D structures. This project introduces a new class of meta-materials called meta-biomaterials. Meta-biomaterials go beyond meta-materials by adding an extra dimension to the complex 3D structure, i.e. complex and precisely controlled surface nano-patterns.
iBUS - iBUS – an integrated business model for customer driven custom product supply chains	01/09/2015	31/08/2019	NMP-35-2014 - Business models with new supply chains for sustainable customer-driven small series production	IA	7440361	6065305	UNIVERSITY OF LIMERICK (Ireland)	The overall objective for iBUS is to develop and demonstrate by 2018 an innovative internet based business model for the sustainable supply of traditional toy and furniture products that is demand driven, manufactured locally and sustainably, meeting all product safety guidelines, within the EU. These services include augmented reality design assistants, design verification tools for compliance with EU product safety guidelines, analysis of environmental footprint and prototyping with additive layer / 3D printing. Subsequently, parametric engineering design principles will take the design from concept to demand.
WRAP - Waste-Based Rapid Adhesive-free Production of Sports goods	01/06/2015	31/05/2018	NMP-18-2014 - Materials solutions for use in the creative industry sector	IA	10784246	7770947	ADIDAS AG (Germany)	WRAP aims to identify and develop innovative partly waste-based long-fibre reinforced composites enabling the automatic production of easily customisable plastic sports goods. The project will focus on the production of balls and shoes and will adopt a design-driven approach exploiting the automation potential of rotation moulding processes, which offer significant design freedom.The starting point is the development of composite materials superimposed in the form of layers in variable ways according to the targeted (custom) shape and the required properties. The insertion of decorative elements in the mould will enable design custom designs, along with 3D printing.
IMPRESS - New Easy to Install and Manufacture PRE-Fabricated Modules Supported by a BIM based Integrated Design ProceSS	01/06/2015	30/11/2018	EE-01-2014 - Manufacturing of prefabricated modules for renovation of building	IA	6072790	4552465	INTEGRATED ENVIRONMENTAL SOLUTIONS LIMITED (UK)	IMPRESS will develop three different prefabricated panels for buildings: (i) a polyurethane based insulated panel with improved thermal performance and light radiation and (ii) a thin, lightweight pre-cast concrete sandwich panel, with optimum thermal and weathering resistance, both of which are suitable for overcladding; (iii) a lightweight pre-cast concrete sandwich panel incorporating Phase Change Materials (PCM) to adapt the thermo-physical properties of the building envelope and enable optimum passive heating and cooling benefits, suitable for recladding. To create the panels, an innovative manufacturing process will be created that includes Reconfigurable Moulding (RM) techniques, 3D laser scanning and 3D printed technology. In addition, 3D printed microstructured formworks will be developed as permanent external layer for the polyurethane panel to match the existing building aesthetics and provide solar radiation efficiency
3D - PRINTGRAPH - GRAPHENE REINFORCE COMPOSITES FOR 3D PRINTING TECHNOLOGY	16/09/2016	15/09/2018	MSCA-IF-2015-EF - Marie Skłodowska-Curie Individual Fellowships (IF-EF)	MSCA-IF-EF	170122	170122	AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS (Spain)	The inter / multidisciplinary approach proposed in the 3D-PRINTGRAPH project will allow the researcher acquiring new skills in Key Enabling Technologies such as advanced graphene materials and 3D printing technology. Moreover, three different secondments in the ASCAMM Technological Center, Hewlett Packard and FAB LAB Barcelona will complement researcher's traininggiving her a multisectoral point of view and a clear idea of transfer of knowledge activities in the field of printing materials.
DNSVCFA - Development of a novel servovalve concept for aircraft	01/09/2017	31/08/2019	MSCA-IF-2015-EF - Marie Skłodowska-Curie Individual Fellowships (IF-EF)	MSCA-IF-EF	183455	183455	UNIVERSITY OF BATH (UK)	The aim of this research project is to develop, in line with the Work Programme 2014-2015 of Horizon 2020 “Smart, green and integrated transport-mobility for growth”, a novel servovalve prototype for aerospace applications having lower complexity and number of parts, lower manufacturing costs and weight, and greater reliability and efficiency compared to common valve configurations.
a-Si PVT-ORC - A novel amorphous silicon cell-based solar cogeneration system using the coupled thermal storage/organic Rankine cycle as an alternative to battery	10/09/2016	09/09/2018	MSCA-IF-2015-EF - Marie Skłodowska-Curie Individual Fellowships (IF-EF)	MSCA-IF-EF	195455	195455	THE UNIVERSITY OF NOTTINGHAM (UK)	The researcher (Dr Jing Li) will investigate a medium temperature photovoltaic/thermal (PVT) system incorporated with the coupled thermal storage/organic Rankine cycle (ORC) as a novel alternative to battery. Due to its unique positive power temperature coefficient, the efficiency of amorphous silicon (a-Si) cell can be higher than that of a crystalline silicon (c-Si) cell when the operating temperature is above 100°C, at which heat is able to drive the ORC. The project has been carefully designed to match Dr Li’s expertise in solar thermal power systems and the expertise of the University of Nottingham in CHP, BiPV, CFD and 3D printing technologies, and thus facilitates a two-way knowledge transfer
microMAGNETOFLUIDICS - 3D-printed magnetic microfluidics for applications in life sciences	01/06/2016	31/05/2018	MSCA-IF-2015-EF - Marie Skłodowska-Curie Individual Fellowships (IF-EF)	MSCA-IF-EF	187420	187420	EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH (Switzerland)	The field of microfluidics is providing answers to several key questions in biology. Specifically, microfluidic single-cell analysis yields important insights into the heterogeneity of cells that is crucial for cancer research, regenerative medicine and drug development. he microMAGNETOFLUIDICS project is strongly interdisciplinary in nature where physics, materials science, and biology are strongly intertwined. The innovative character of this proposal is unprecedented since no previous studies have been reported on 3D-printed magnetic microvalves operating within a microfluidic channel.

iREACT - Inkjet-Printed Wireless Powered Circuits for Sensing and Identification	11/02/2016	10/02/2019	MSCA-IF-2014-GF - Marie Skłodowska-Curie Individual Fellowships (IF-GF)	MSCA-IF-GF	257191	257191	CENTRE TECNOLOGIC DE TELECOMUNICACIONS DE CATALUNYA (Spain)	The project establishes the application of inkjet printing as a key technology for the implementation of batteryless and wireless sensor and communication circuits based on wireless power transfer and energy harvesting, enabling the realization of the Internet of Things (IoT). Inkjet printing supports a large volume production, achieves a good resolution necessary for high frequency electronics, enables the use of a variety of low cost and flexible materials, and is a direct-write, and additive manufacturing technology.
DLCHHB - Artificial Tissue Actuators by the 3D Printing of Responsive Hydrogels	01/07/2015	31/12/2017	MSCA-IF-2014-GF - Marie Skłodowska-Curie Individual Fellowships (IF-GF)	MSCA-IF-GF	226825	226825	THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD (UK)	This proposal describes the 3D printing of hydrogel droplet networks to prepare artificial tissue-like materials that demonstrate stimulus-responsive chemo-mechanical actuation. A recent breakthrough by Prof. Bayley's research group has enabled the 3D printing of self-supporting droplet networks which can be functionalised to allow rapid electrical and molecular communication along a specific path. As a result of this, an opportunity now exists to prepare tissue-like materials that can perform mechanical work in response to external stimuli. By printing biocompatible and responsive polymer hydrogels into droplet networks, artificial muscles will be prepared that display specific and well-defined motion. The resulting technology will be of great importance for a variety of biomaterial applications, with future European Union (EU) industrial growth as well as the public ultimately benefiting from progress in this area.
DISTRO - Distributed 3D Object Design	01/01/2015	31/12/2018	MSCA-ITN-2014-ETN - Marie Skłodowska-Curie Innovative Training Networks (ITN-ETN)	MSCA-ITN	3264733	3264733	UNIVERSITY COLLEGE LONDON (UK)	The DISTRO network brings together leading laboratories in Visual Computing and 3D Computer Graphics research across Europe with the aim of training a new generation of scientists, technologists, and entrepreneurs that will move Europe into a leading role in the scientific and technological innovation in the area of casual, distributed 3d object design and customization. Whilst digital content has certainly grown, the world's economy is still dominated by manufacturing. A new class of "rapid prototyping" technologies, from 3D printers to laser cutters, are making the process of manufacturing physical objects look increasingly like that of creating digital content.
NEXT-3D - Next generation of 3D multifunctional materials and coatings for biomedical applications	01/06/2015	31/05/2017	MSCA-RISE-2014 - Marie Skłodowska-Curie Research and Innovation Staff Exchange (RISE)	MSCA-RISE	193500	193500	THE UNIVERSITY OF BIRMINGHAM (UK)	NEXT-3D is an innovative European-Australian project that consists of 4 academic and 2 non-academic members. The research methodology is based on the multi-disciplinary and inter-sectorial collaboration among the network participants and focuses into main themes: 3D Printing, Enhance Coating, and medical translation with the main aim to develop the next generation of multifunctional 3D materials for orthopaedic and dental implants.
CerAMfacturing - Development of ceramic and multi material components by additive manufacturing methods for personalized medical products	01/10/2015	30/09/2018	FoF-10-2015 - Manufacturing of custom made parts for personalised products	RIA	5121800	5121800	FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V (Germany)	The cerAMfacturing project will develop a completely new approach for ceramic multi material additive manufacturing which will allow series production of customised and multifunctional components for manifold applications for obtaining property combinations, like electrical conductive/electrical insulating, dense/porous or two-colored components.
EMUSIC - Efficient Manufacturing for Aerospace Components USing Additive Manufacturing, Net Shape HIP and Investment Casting	01/04/2016	31/03/2019	MG-1.10-2015 - International cooperation in aeronautics with China	RIA	2193279	1799994	THE UNIVERSITY OF BIRMINGHAM (UK)	This proposal is in response to the call for International Cooperation in Aeronautics with China, MG-1.10-2015 under Horizon 2020 "Enhanced Additive Manufacturing of Metal Components and Resource Efficient Manufacturing Processes for Aerospace Applications". The objectives are to develop the manufacturing processes identified in the call: (i) Additive manufacturing (AM); (ii) Near Net Shape Hot Isostatic Pressing (NNSHIPping) and (iii) Investment Casting of Ti alloys.
ToMax - Toolless Manufacturing of Complex Structures	01/01/2015	31/12/2017	FoF-02-2014 - Manufacturing processes for complex structures and geometries with efficient use of material	RIA	3157986	3157986	TECHNISCHE UNIVERSITAET WIEN (Austria)	ToMax aims at developing integrated lithography-based additive manufacturing systems for the fabrication of ceramic parts with high shape complexity. The focus of the project is to unite industrial know-how in the field of software development, photopolymers and ceramics, high-performance light-sources, system integration, life cycle analysis, industrial exploitation and rewarding end-user cases.
DIMAP - Novel nanoparticle enhanced Digital Materials for 3D Printing and their application shown for the robotic and electronic industry	01/10/2015	30/09/2018	NMP-07-2015 - Additive manufacturing for tabletop nanofactories	RIA	4997351	4997351	PROFACTOR GMBH (Austria)	DIMAP project focuses on the development of novel ink materials for 3D multi-material printing by PolyJet technology. We will advance the state-of-the art of AM through modifications of their fundamental material properties by mainly using nanoscale material enhanced inks. This widens the range of current available AM materials and implements functionalities in final objects.
CAxMan - Computer Aided Technologies for Additive Manufacturing	01/09/2015	31/08/2018	FoF-08-2015 - ICT-enabled modelling, simulation, analytics and forecasting technologies	RIA	7143300	7143300	STIFTELSEN SINTEF (Norway)	The objectives of **Computer Aided Technologies for Additive Manufacturing (CAxMan)** are to establish Cloud based Toolboxes, Workflows and a One Stop-Shop for CAx-technologies supporting the design, simulation and process planning for additive manufacturing.
BOREALIS - Borealis – the 3A energy class Flexible Machine for the new Additive and Subtractive Manufacturing on next generation of complex 3D metal parts.	01/01/2015	31/12/2017	FoF-02-2014 - Manufacturing processes for complex structures and geometries with efficient use of material	RIA	7986625	5968875	PRIMA INDUSTRIE SPA (Italy)	Borealis project presents an advanced concept of machine for powder deposition additive manufacturing and ablation processes that integrates 5 AM technologies in a unique solution. The machine is characterized by a redundant structures constituted by a large portal and a small PKM enabling the covering of a large range of working cube and a pattern of ejective nozzles and hybrid laser source targeting a deposition rate of 2000cm3/h with 30 sec set-up times.

NANOTUN3D - Development of the complete workflow for producing and using a novel nanomodified Ti-based alloy for additive manufacturing in special applications.	01/10/2015	31/03/2019	NMP-07-2015 - Additive manufacturing for tabletop nanofactories	RIA	2936657	2936656	INSTITUTO TECNOLOGICO METALMECANICO, MUEBLE, MADERA, EMBALAJE Y AFINES-AIDIMME (Spain)	NANONTUN3D will take advantage of the possibilities of Additive Manufacturing (AM) together with the development of a specially tailored Ti- based nano-aditived material to achieve dramatic improvements in structural parts of aero, space, mobility, and equipment sectors, reaching expected savings between 40% and 50% of material in critical applications. inherent benefits of AM will be kept (decrease in throughput times, tool-less production, high buy-to–fly-run ratios, etc.).
[PROJET] FAST - Functionally graded Additive Manufacturing scaffolds by hybrid manufacturing	01/12/2015	30/11/2019	NMP-07-2015 - Additive manufacturing for tabletop nanofactories	RIA	4916750	4916750	UNIVERSITEIT MAASTRICHT (Netherlands)	Scaffolds production for tissue regeneration is one of the main fields where the “Design for Function” feature of AM make the difference relative to the other production techniques if in the production process all the needed “Functions” can be introduced: mechanics, geometry (porosity and shape), biomaterial, bio-active molecules and surface chemical groups. The FAST project aims to integrate all these “Functions” in the single AM process
AMOS - Additive Manufacturing Optimization and Simulation Platform for repairing and re-manufacturing of aerospace components	01/02/2016	31/01/2020	MG-1.9-2015 - International cooperation in aeronautics with Canada	RIA	1396189	1396189	THE UNIVERSITY OF SHEFFIELD (UK)	This research project focuses on several key Direct Energy Deposition (DED) Additive Manufacturing (AM) processes that have great potential to be used as cost-effective and efficient repairing and re-manufacturing processes for aerospace components such as turbine blades and landing gears. This project aims to conduct fundamental research to understand the material integrity through chosen DED AM processes, the accuracy and limitations of these deposition processes, effective defect geometry mapping and generation methods, and automated and hybrid DED and post-deposition machining strategies.
DISTRACTION - Design against DISTortion of metallic aerospace parts based on combination of numeRical modelling ACTivities and topology optimisatION	04/01/2016	03/01/2019	JTI-CS2-2014-CFP01-AIR-02-07 - Design Against Distortion: Part distortion prediction, design for minimized distortion, metallic aerospace parts	RIA	449420	449420	LORTEK S COOP (Spain)	Design against Distortion topic is focused on the development of numerical modelling strategies which can anticipate distortions even from the design stage. In this context, DISTRACTION project copes with the development and application of rapid distortion prediction numerical methodologies applicable to machining and additive layer manufacturing (ALM) of metallic parts and the development of concurrent topology optimisation codes capable of accounting for part distortion.
Cell3Ditor - Cost-effective and flexible 3D printed SOFC stacks for commercial applications	01/07/2016	31/12/2019	FCH-02.6-2015 - Development of cost effective manufacturing technologies for key components or fuel cell systems	RIA	2191134	2180663	FUNDACIO INSTITUT DE RECERCA DE L'ENERGIA DE CATALUNYA (Spain)	The main goal of the Cell3Ditor project is to develop a 3D printing technology for the industrial production of SOFC stacks by covering research and innovation in all the stages of the industrial value chain (inks formulation, 3D printer development, ceramics consolidation and system integration).
ReDSHIFT - Revolutionary Design of Spacecraft through Holistic Integration of Future Technologies	01/01/2016	31/12/2018	PROTEC-1-2015 - Passive means to reduce the impact of Space Debris	RIA	3230295	3230294	CONSIGLIO NAZIONALE DELLE RICERCHE (Italy)	ReDSHIFT will address barriers to compliance for spacecraft manufacturers and operators presented now and in the future by requirements and technologies for de-orbiting and disposal of space objects. ReDSHIFT will take advantage of disruptive opportunities offered by 3D printing to develop highly innovative, low-cost spacecraft solutions, exploiting synergies with electric propulsion, atmospheric and solar radiation pressure drag, and astro-dynamical highways, to meet de-orbit and disposal needs, but which are also designed for demise.
Scan4Reco - Multimodal Scanning of Cultural Heritage Assets for their multilayered digitization and preventive conservation via spatiotemporal 4D Reconstruction and 3D Printing	01/10/2015	30/09/2018	REFLECTIVE-7-2014 - Advanced 3D modelling for accessing and understanding European cultural assets	RIA	3762762	3417762	CENTRE FOR RESEARCH AND TECHNOLOGY HELLAS (Greece)	Scan4Reco will develop a novel portable, integrated and modular solution for customized and thus cost-effective, automatic digitization and analysis of cultural heritage objects (CHOs), even in situ. A multi-sensorial 3D scanning - facilitated by a mechanical arm – will collect multi-spectra data and then, a hierarchical approach for 3D reconstruction of CHOs will be applied, enabling multi-layered rendering, advancing both analysis and 3D printing procedures.
RegoLight - Sintering Regolith with Solar Light	01/11/2015	31/10/2017	COMPET-03-2015 - Bottom-up space technologies at low TRL	RIA	999373	999373	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV (Germany)	Future human activity on the lunar surface will use 3D printing to build infrastructure from lunar soil using the Sun as the only source of energy. Today this technology is considered disruptive; tomorrow it will be the standard. The RegoLight project will investigate the sintering process of lunar regolith simulants by means of concentrated sun light in order to prepare for future lunar missions for building infrastructure (leveled terrain, dust shelters, launch pads etc.) and structural components for lunar habitats.
PRINTCR3DIT - Process Intensification through Adaptable Catalytic Reactors made by 3D Printing	01/10/2015	30/09/2018	SPIRE-05-2015 - New adaptable catalytic reactor methodologies for Process Intensification	RIA	5493891	5493891	STIFTELSEN SINTEF (Norway)	The concept of PRINTCR3DIT is to employ 3D printing to boost process intensification in the chemical industries by adapting reactors and structured catalysts to the requirements of the reaction. This manufacturing technique is particularly useful in reactions where diffusion, mixing and/or heat transfer are limitations against reaching higher performance. The utilization of the concept of 3D printing will also reduce the resource utilization of reactor and catalyst manufacture, energy consumed (< 15%) and transportation

MovAiD - Movement Assisting Devices: Manufacturing of personalized Kineto-Dynamics parts and products for workers, elderly and children	01/09/2015	31/08/2018	FoF-10-2015 - Manufacturing of custom made parts for personalised products	RIA	5954375	5136875	CHAS A BLATCHFORD AND SONS LIMITED (UK)	To achieve long term benefits for the European society, the proposal addresses those three groups with the development of a next generation of Movement Assistive Devices (MADs): innovative, "passive" and highly customized kineto-dynamic equipment, built to provide natural compensation of human movements (both upper and lower limbs). MADs will be conceived and developed exploiting a generative design approach (capable to combine unique morphological characteristics with personalized kinematics) coupled with an innovative additive multi-material technology (capable to deliver specific mechanical properties),
Symbionica - SYMBIONICA - Reconfigurable Machine for the new Additive and Subtractive Manufacturing of next generation fully personalized bionics and smart prosthetics	01/10/2015	30/09/2018	FoF-10-2015 - Manufacturing of custom made parts for personalised products	RIA	7305000	4908750	SINTEA PLUSTEK SRL (Italy)	Symbionica project focuses on the manufacturing of personalized bionics, smart endoprosthetics and exo-prosthetics that require geometric and functional customization. The Symbionica concept integrates an innovative machine performing deposition of advanced materials and subtractive processes along with a supply chain distributed co-engineering platform for advanced design and full personalization involving all relevant stakeholders, design and engineering of the products and through-life services. Symbionica manufacturing solution is conceived as a multi-material AM machine for material deposition and ablation, flexible and reconfigurable in the working cube, the material processing, the technology and the manufacturing strategy, with an advanced closed loop control methodology for product and process quality monitoring. This way Symbionica products are manufactured in one processing step, complex in shape, 3D structured and joint free.
Lattice Cage - Titanium based Cervical Spine Implants manufactured using 3D laser sintering to produce a structure optimised for graft-free bone in-growth	01/08/2016	31/10/2016	SMEInst-05-2016-2017 - Supporting innovative SMEs in the healthcare biotechnology sector	SME Instrument - Phase 1	71429	50000	WINSOR MEDICAL LIMITED (UK)	We have developed a Titanium cervical fusion cage, Lattice Cage, using 3D additive manufacturing to form an osteoconductive structure to eliminate the use of bone grafts and to aid fusion by promoting cell (osteoblast) proliferation, driving the new bone growth. Our off the shelf implants manufactured using 3D laser sintering will be ~ 50% cheaper than any other Ti implants manufactured using EBM, will reduce surgical costs and decrease post-operative complicationsosteoconductive structure to eliminate the use of bone grafts and to aid fusion by promoting cell (osteoblast) proliferation, driving the new bone growth. Our off the shelf implants manufactured using 3D laser sintering will be ~ 50% cheaper than any other Ti implants manufactured using EBM, will reduce surgical costs and decrease post-operative complications,
3DTTool - Next Generation of Cutting Tools Using Additive Manufacturing Technology I, Phase 1	01/06/2016	31/10/2016	SMEInst-02-2016-2017 - Accelerating the uptake of nanotechnologies advanced materials or advanced manufacturing and processing technologies by SMEs	SME Instrument - Phase 1	71429	50000	DANSKE VAERKTOEJ APS (Denmark)	Our goal is to develop the next generation of thread cutting tools by using additive manufacturing technology (3D printing). Thread cutting tools are used to make screw threads – the main building blocks of modern day machinery. However, these tools have developed very little since they were invented over 100 years ago besides alternating materials used or adding new coatings for the tools to make them stronger.
LESA - Laser bonding of linear edged super-abrasive blades	01/07/2015	31/12/2015	NMP-25-2015-1 - Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs	SME Instrument - Phase 1	71429	50000	C4 CARBIDES LIMITED (UK)	C4 Carbides of Cambridge (UK) are a manufacturer and supplier of linear edge abrasive blades to many of the world's biggest brand names in power tool accessories, and industrial cutting and machining equipment. We have identified laser metal deposition (LMD) - additive manufacturing techniques – as a revolutionary new way to manufacture profiled super-abrasive coated linear edge blades. This has the potential to create a new product category across both the power tool accessories market and the machining and fabrication industry.
ASURI - Advanced Surgical Implants (ASURI)	01/07/2016	31/12/2016	SMEInst-01-2016-2017 - Open Disruptive Innovation Scheme	SME Instrument - Phase 1	71429	50000	DO3D INNOVATIONS KFT (Hungary)	The ASURI project at DO3D Innovations Ltd. aims to enter the 3D – printed medical implant and surgical guide market with a 3D printing service that integrates the whole medical implant and surgical guide design and manufacturing process. Our solution is innovative, safe, fast, cost effective and unquestionable from a healthcare and regulatory perspective. The novelty of our solution lies in the integration of castable 3D printing techniques with high precision casting in the area of medical implants
GeoFood - First industrial use of bio and ecocompatible geopolymers produced from metakaolin to manufacturetanks for wine, beer, vinegar and olive oil production and storage via 3D printing technology	01/06/2016	30/11/2016	SMEInst-07-2016-2017 - Stimulating the innovation potential of SMEs for sustainable and competitive agriculture, forestry, agri-food and bio-based sectors	SME Instrument - Phase 1	71429	50000	CIBAS DI POLI FABIO & C SAS (Spain)	The aim of GEOFOOD project is to develop an innovative eco-friendly industrial process to enable the use of geopolymers (produced from metakaolin) and 3D printing technology in the production of food preparation/storage ceramic objects (e.g.vessels for wine, beer, etc. production/storage). Geopolymers have the advantages of delivering food safety to consumers (no use of toxic pigments) and reducing energy consumption. 3D printing brings the additional values of faster manufacturing,

PIONEeRING - Patlent specific bONE RepositionING	01/07/2015	31/12/2015	INSO-10-2015-1 - SME business model innovation	SME Instrument - Phase 1	71429	50000	XILLOC MEDICAL BV (Netherlands)	The goal is to develop and commercialise an innovative and easy to use online portal and 3D surgical planning software, and two new patient-specific radius implant products to correct bone deformities. Both products will revolutionise future reconstructive surgery and planning since they enable accurate bone reconstruction with minimum surgical effort. A completely new online portal and 3D surgical planning software will be developed based on patient-specific anatomy from a standard CT-scan of the affected bone and the contralateral bone. The software enables accurate planning of reconstructive surgery for each patient. It helps designing the implant products semiautomatically. The implant manufacturing procedure will be developed using 3D metal and polymer printing. 3D printing gives full freedom of design, allowing to optimise the implant's (internal) shape and mechanical load transfer and may render the surgical procedure minimally invasive.
HyBurn - New high temperature in-situ premix gas combustion systems for more efficient and cleaner combustion of hydrogen and lean gases	01/06/2015	03/11/2015	SIE-01-2014-1 - Stimulating the innovation potential of SMEs for a low carbon energy system	SME Instrument - Phase 1	71429	50000	PROMEOS GMBH (Germany)	The new promeos in-situ premix burner is built on a new concept of micro premixing via a 3D-channel structure just before the flame front – an approach called MFT "mixing flame trap". It is only with this approach that the system can burn special and lean gases in a more efficient and safer way. It is also capable of generating higher temperatures than catalytic burners, where the catalyst reduces the temperature at which the fuel starts to burn. The MFT component can only be manufactured at target costs by making use of a 3D-printing approach.
PICSIMA - Next generation 3D print technology (PICSIMA), which for the first time enables the direct full colour printing of silicone to make soft tissue prostheses, orthoses and removable partial dentures.	01/06/2015	30/11/2015	NMP-25-2014-1 - Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs	SME Instrument - Phase 1	71429	50000	FRIPP DESIGN LIMITED (UK)	Prostheses are artificial body parts, which can also be soft tissue such as the nose and ears, and orthoses are external artificial devices for supporting the limbs or spine or to prevent/assist relative movement. The current manufacturing process of these involves first taking an impression from the patient, making the mould, hand painting it and then modifying it to fit. Fripp Design and Research, one of Europe's leading providers of innovative 3D print solutions, seeks to commercialise a new method for the rapid manufacture of soft tissue prostheses by developing the world's first full colour silicone 3D Printer to replace the current moulding manufacturing method that is time consuming, highly variable and very costly. The use of faster and highly accurate 3D printing technology in the medical devices industry will not only lower costs by up to 72% but will also open up new design freedoms that prior to this were only dreams. The 3D printer developed can also be used in making orthoses and removable partial dentures (RPD) frameworks using silicone.
Efficient Cooking - Substainable and efficient food processing and cooking sytem	01/05/2015	31/10/2015	SFS-08-2014-1 - Resource-efficient eco-innovative food production and processing	SME Instrument - Phase 1	71429	50000	2 VEGAN NATURAL MACHINES S.L, (Spain)	Natural Machines is a SME that has created the first 3D food printer that works with sweet and savory ingredients. We are focused on helping people get back to home cooking, back to healthy food, by bringing the food processing plant to the home kitchens, giving an eco-efficient alternative to traditional food processing, reducing food waste to zero and with significant savings in energy and packaging needed with no need to spend time cooking or knowing how to do it. In order to get our product to the home kitchens, users have requested two main features that go far beyond 3D printing technology. The two systems are a new cooking technology that uses just a fraction of the energy used by traditional ovens and microwave ovens and a prefilled capsule system. Both systems working together will convert our new device in an optimised sustainable mini food processing plant at home.
Ownerchip - Digital Rights Management Infrastructure For 3D Printed Artifacts	01/10/2014	31/03/2015	ICT-37-2014-1 - Open Disruptive Innovation Scheme (implemented through the SME instrument)	SME Instrument - Phase 1	71429	50000	THINGS3D LIMITED (UK)	The OWNER-CHIP project will enable a Digital Rights Management (DRM) platform to connect brand owners of digitised assets with 3D printing bureaus. OWNER-CHIP will authenticate the manufactured product with a unique, embedded verification technology developed in stage 2 of the project; protecting the brand owners / IP licensors from counterfeiting and enabling added functionality and enriched content via mobile phone and gaming platforms (digital-physical extension).
EBMPerform - High-quality, high-speed EBM 3D printing by the integration of high-performance electron sources	01/08/2015	31/07/2017	NMP-25-2014 - Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs	SME Instrument - Phase 2	2394400	1648035	ARCAM AB (Sweden)	The aim of this work is to overcome key obstacles concerning future requirements for EBM 3D printing for production of aerospace parts through the integration of two enabling technologies. The work will develop and integrate a novel plasma cathode electron source with an EBM machine focusing on realising the enhanced capabilities of low maintenance, consistent manufacturing performance and higher productivity.
ANAPRINT - Additive Printing for Cell-Based Analysis	01/11/2015	31/10/2017	NMP-25-2015 - Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs	SME Instrument - Phase 2	2987100	2090970	AvantiCell Science Ltd (UK)	The Project shall develop a unique manufacturing solution for the automated production of complex cell models widely used by industry to test biological activity and biosafety. No means of scalable manufacture presently exists. The technical solution is to assemble cell models by additive manufacturing; to control the resident cells' locations within these 3D models; to supply the models to customers as pre-assembled, frozen products. The result shall be an analytical tool which, unlike current practice, does not compromise analytical output for convenience, but combines high predictive value and low cost with exceptional user-friendliness.

ChemSniff - Chemical sniffer device for multi-mode analysis of threat compounds	01/09/2015	31/08/2017	DRS-17-2014 - Critical infrastructure protection topic 7: SME instrument topic: "Protection of Urban soft targets and urban critical infrastructures"	SME Instrument - Phase 2	2252900	1577030	DA VINCI EUROPE LABORATORY SOLUTIONS BV (Netherlands)	ChemSniff will develop a multi-mode sniffer device for real-time detection of chemical compounds contained in CBRN-E substances. This will enable high throughput screening of soft targets such as vehicles, people and their personal effects. The technology is based on a linear ion trap (LIT) mass spectrometer (MS) operating in a non-scanning mode. A non-scanning LIT allows selective ion monitoring of target threat molecules using optimal voltages for each ion mass without performing a full mass spectral scan. This result is higher sensitivity, simpler control electronics, smaller size, lower power consumption and cost. This will be done through improved designs based on results from numerical modelling, operational designs, novel low-cost 3D printing manufacturing, electronics simplification and vacuum system optimisation.
VSP - Volumental - The Cloud-Delivered 3D Scanning Service Supporting A Future Of Mass Customization	01/04/2015	30/09/2016	ICT-37-2014 - Open Disruptive Innovation Scheme (implemented through the SME instrument)	SME Instrument - Phase 2	2087000	1460900	VOLUMENTAL AB (Sweden)	Volumental is currently building, and delivering, leading software technology that enables the 3D scanning of objects, (e.g. bodies), using both current and emerging camera technologies. The resulting accurate scans can be readily used by mainstream 3D software systems & packages. Volumental is currently focusing on the mass customization market, even though Volumental technology itself is broadly applicable. We sell software solutions B2B to e.g. footwear brands that can use 3D body data to customize e.g. shoes to the multibillion footwear market. We have a number of partners and pilot customers in this field already, among them US footwear brands and the worlds largest hardware manufacturers in our field. Enabling technology development of mass customization in Europe offers the opportunity to move production products that touch the human body back to European markets as well as building technology leadership within fields such as 3D scanning and 3D printing.
Dymant-bm - Disrupting luxury craftsmanship through innovation : An innovative model for a traditional sector	01/02/2016	31/07/2017	INSO-10-2015 - SME business model innovation	SME Instrument - Phase 2	1650000	931000	DYMANT.COM (France)	Dymant is a technology-driven startup that aims at disrupting and sublimating the luxury experience. We transform the luxury market by using technology to design (using state of the art 3D modeling techniques and 3D-Printing), customize (using real time 3D rendering) and commercialize (via an online private club) luxury goods faster, more efficiently and more sustainably than before. The objective is to offer luxury products with a high degree of customization. To do so, Dymant is developing a solution that connects its proprietary database of European craftsmen with its client, while giving them the tools that enhance the luxury experience for both of them.