

## **AVVISO FISA 2023**

### **AREE TEMATICHE**

#### **1) ADVANCED MANUFACTURING**

Innovative and cutting-edge technologies such as robotics, 3D printing, artificial intelligence, high-performance computing and modelling, to produce complex products. Solutions that optimises processes towards products having no defects, avoiding any waste, reducing industrial pollution, material consumption and energy use.

Field and Technologies: Additive Manufacturing • Industry 4.0 concepts • Industrial-IoT • Manufacturing process optimization • Sensor technology • Interconnectivity between factories and manufacturing sites • 5G and 6G13 • Intelligent robotics • Autonomous systems • UAV technology • Telecommunications • Operating systems for various nodes

#### **2) ADVANCED MATERIALS**

Chemicals and advanced materials, including nanomaterials essential for well-being and the high living standards of our societies.

Filed and Technologies: Nanomaterials • Biomaterials • Tools and processes for the design and realization of new materials and resulting products • Chemistry, physical and biological foundations as well as advancements for new materials • 3D printing and design • Design of new products based on the new materials or advancements, especially in the context of chemicals, polymers, metals and alloys, glass, ceramics, composites, etc.

#### **3) LIFE-SCIENCE TECHNOLOGIES**

Life-science technologies can be seen as an intersection of engineering and life sciences dealing with the technical use of findings related to life science, especially in the interrelation of biology, automation and digitalisation.

Field and Technologies: Biological data analytics • Machine Learning applications in biology • Lab-on-a-chip • Cell and tissue engineering • Neurotechnology • Genomics including synthetic genomes • Bioelectronics • Biomaterials in general • Bioengineering

#### **4) MICRO/NANO-ELECTRONICS AND PHOTONICS**

The micro/nano-electronics and photonics relate to all types of digital and computing technologies in the magnitude of high-performance computing and communication based on micro/nanoelectronics.

Field and Technologies: High-Performance Computing • Micro- and nanoelectronics for IoT sensors and tokens • Integrated circuit design • High-Speed Optical Networks, Protocols and Standards • Quantum-IT • Quantum Computing • Quantum Communication and Quantum Key Distribution • Quantum Sensing • Cloud Quantum Computing • Methods and Tools for Quantum Software Development • Processes and support for handling NISQ (Noise Intermediate Scale Quantum) computing aspects • Development and application of QC to real world problems

## **5) ARTIFICIAL INTELLIGENCE**

AI solutions that have positive impacts on society and the economy (including better access to and use of scientific data). Development of Trustworthy AI by improving diversity and prompting ethics.

Field and technologies: Development and domain specific application of algorithms and models for machine learning (ML) • Quality of AI based decisions • Explainability and Transparency of AI-based algorithms • Certification of AI algorithms • Quantum AI and Quantum Machine Learning • AI applications for SMEs and for large scale industry • Artificial intelligence for Smart Cities and Communities • Quality of training and test data sets • AI-as-a-Service provided by platforms located in EU • Privacy Preservation within AI processes and frameworks • Ethical and fairness aspects for AI to meet EU values

## **6) SECURITY AND CONNECTIVITY**

This KET stands for various ICTs and their cyber-security aspects. The security and connectivity technologies are a fundamental enabler and building block for other KETs and for digital transformation.

Field and technologies: • Communication and network protocols and technologies • Large-scale and Europe-wide IoT networks • FTTx (Fibre to the X) deployments • Certification methods for network and software architectures • Operating systems and platforms for digital services and applications • Network components - routers, firewalls, intrusion detection/prevention systems for critical infrastructure • Quantum Key Distribution • Cryptography and its security implications • Post-quantum cryptography • Activities in the scope of national and international standardization bodies • Structure and the security of telecommunication networks • Distributed ledger technologies (e.g. blockchain technology)