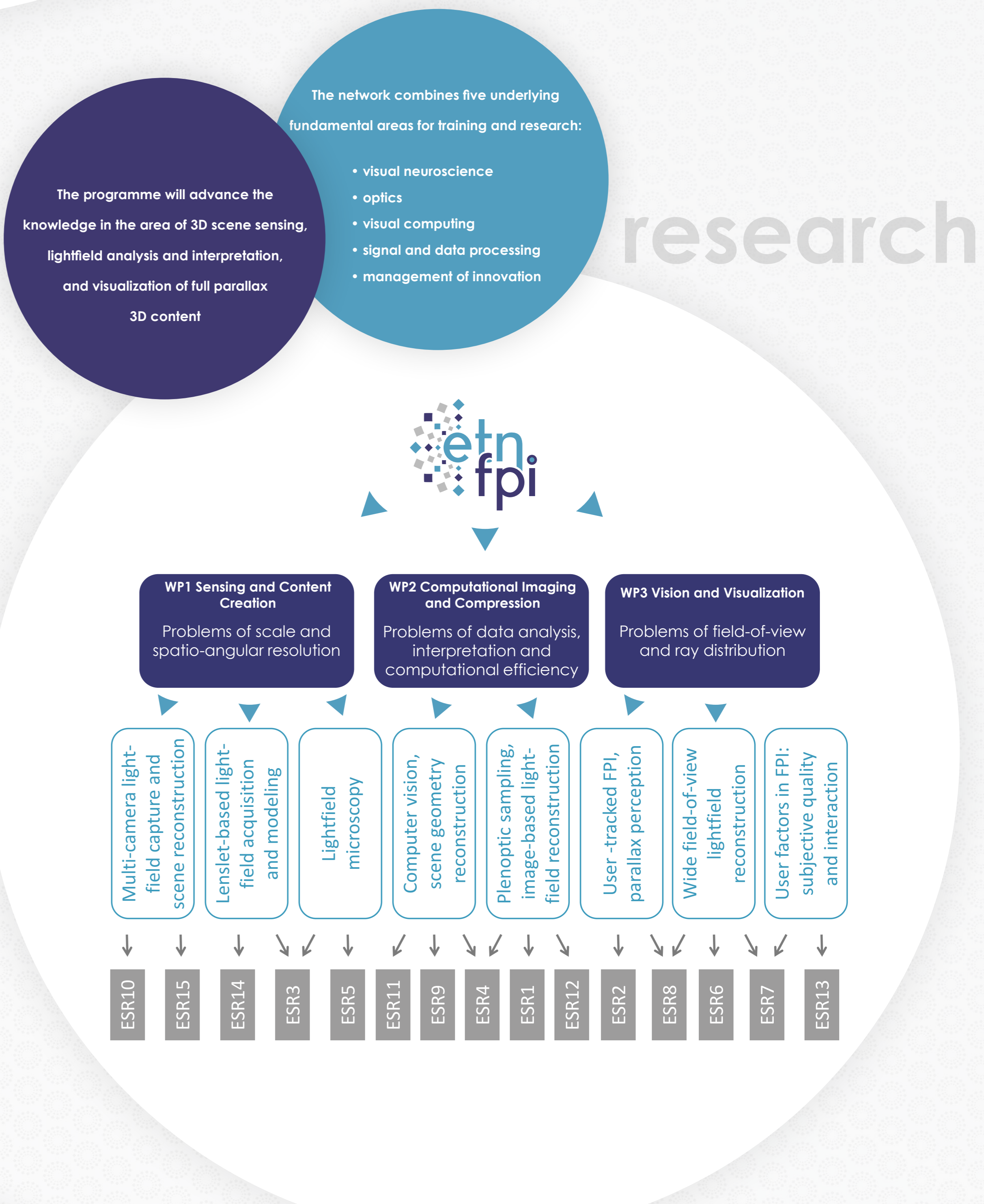# european training network
on full parallax imaging

The project studies the phenomena of lightfield formation, propagation and perception in order to develop future imaging devices, which recreate the visual world realistically. Different disciplines deal with these phenomena. Physics and optics look at light as either wave or ray phenomenon and study its propagation and diffraction effects therein. Computer graphics deals with properties of materials, lighting conditions and corresponding ray rendering. Computer vision studies object recognition, scene analysis and interpretation. Visual neuroscience builds computational models to describe and quantify how our vision works. Naturally, different fields of science approach relevant problems using different concepts and terminology.
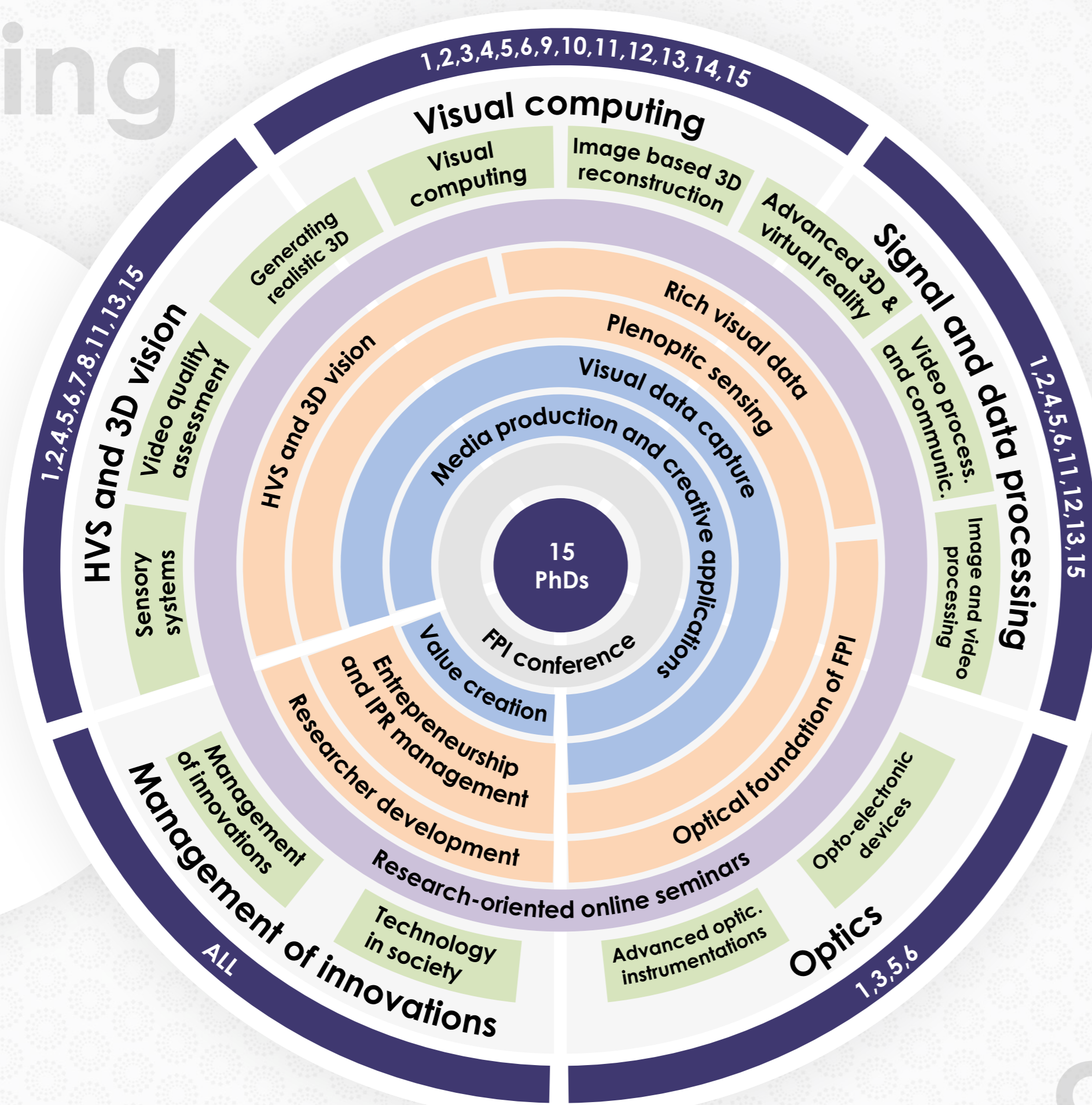
TThe research programme is organized in three work packages (WPs), where individual projects are integrated in order to address the challenges in full parallax imaging:

WP1: Sensing and content creation, focusing on problems of optimal spatial-angular resolution for lightfield sensing

WP2: Computational imaging and compression, focusing on problems of analysis, interpretation and compression of lightfield data

WP3: Vision and Visualization, focusing on problems of full parallax visualization of 3D data

research

The programme will advance the knowledge in the area of 3D scene sensing, lightfield analysis and interpretation, and visualization of full parallax 3D content

The network combines five underlying fundamental areas for training and research:

- visual neuroscience
- optics
- visual computing
- signal and data processing
- management of innovation

etn fpi

WP1 Sensing and Content Creation
Problems of scale and spatio-angular resolution

WP2 Computational Imaging and Compression
Problems of data analysis, interpretation and computational efficiency

WP3 Vision and Visualization
Problems of field-of-view and ray distribution

| Multi-camera light-field capture and scene reconstruction | Lenslet-based light-field acquisition and modeling | Lightfield microscopy | Computer vision, scene geometry reconstruction | Plenoptic sampling, image-based light-field reconstruction | User-tracked FPI, parallax perception | Wide field-of-view lightfield reconstruction | User factors in FPI: subjective quality and interaction |

| ESR10 | ESR15 | ESR14 | ESR3 | ESR5 | ESR11 | ESR9 | ESR4 | ESR1 | ESR12 | ESR2 | ESR8 | ESR6 | ESR7 | ESR13 |

training

Legend
- Workshop
- Training School
- FPI conference
- Online seminar
- Local courses
- ESRs

FPI: Full parallax imaging
HVS: Human visual system

Visual computing — 1,2,3,4,5,6,9,10,11,12,13,14,15
- Visual computing
- Generating realistic 3D
- Image based 3D reconstruction
- Advanced 3D & virtual reality

HVS and 3D vision — 1,2,4,5,6,7,8,11,13,15
- Video quality assessment
- Sensory systems
- HVS and 3D vision
- Rich visual data
- Plenoptic sensing
- Visual data capture
- Media production and creative applications

Signal and data processing — 1,2,4,5,6,11,12,13,15
- Video process. and communic.
- Image and video processing

Optics — 1,3,5,6
- Optical foundation of FPI
- Opto-electronic devices
- Advanced optic. instrumentations

Management of innovations — All
- Management of innovations
- Research-oriented online seminars
- Technology in society
- Researcher development
- Entrepreneurship and IPR management
- Value creation
- FPI conference

15 PhDs

full-parallax-imaging.eu
etn-fpi.eu

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network

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