

Experience from participation in COST Actions

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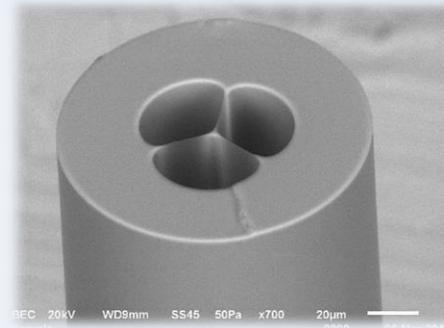
Department of Electromagnetic Field





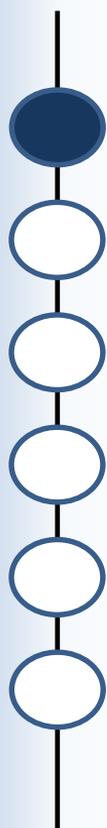
Outline

- **Our COST project**
- **Our experience and achieved results**
- **Our contribution in COST MP1401**
- **Benefits of the COST Action**
- **International cooperation**
- **Summary**

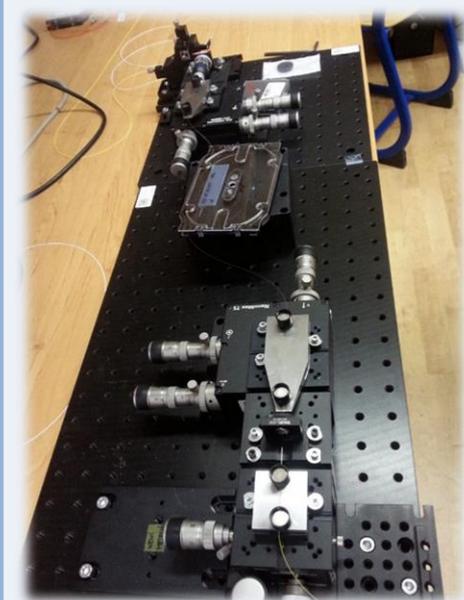
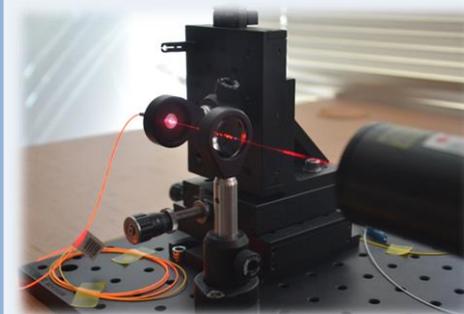




Our COST project

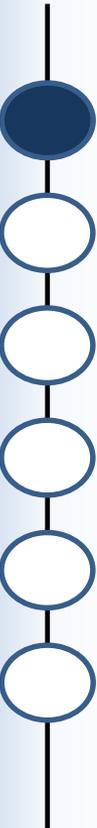


- **EU COST Action MP1401**
**ADVANCED FIBRE LASER AND COHERENT SOURCE AS TOOLS
FOR SOCIETY, MANUFACTURING AND LIFESCIENCE**
- 12/2014-12/2018
- led by prof. Stefano Taccheo, University of Swansea, UK
- 4 work-packages – glass materials, fiber lasers, applications, SIG
- 28 members (EU + Switzerland, Israel)
- NNC – Armenia and Russia
- 250 participants from 140 institutions

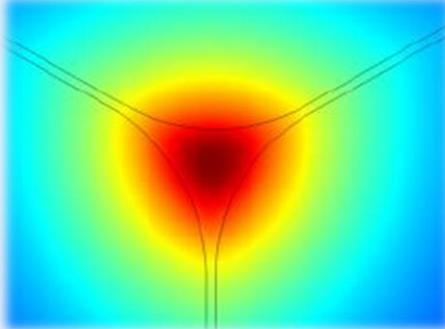
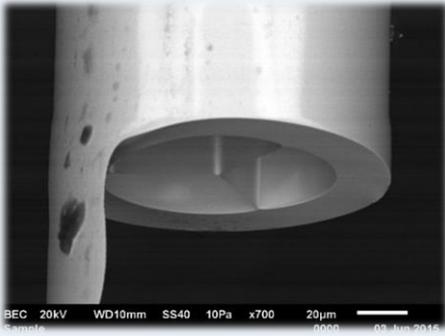




Our COST project

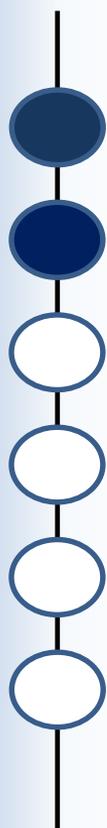


- In the end of 3rd year at the moment
- Participated in meetings:
 - Brussels, Belgium, 2015
 - Zadar, Croatia, 2015
 - Tel Aviv, Israel, 2016
 - Summer school (ITC) in Prague, 2016
 - Jena, Germany, 2017
 - Winter school (ITC), now in Lausanne, Switzerland
- Participated as:
 - MC substitute (Brussels), then as MC
 - WG4 co-chair – Special Interest Group
 - STSM participant
 - STSM recipient/supervisor

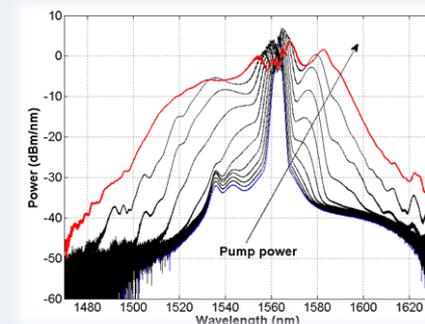
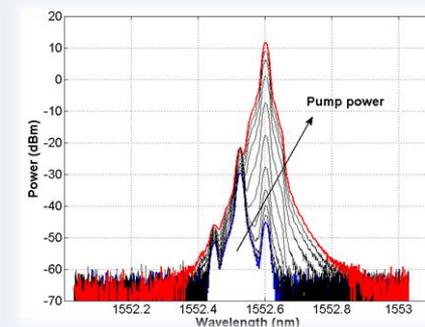
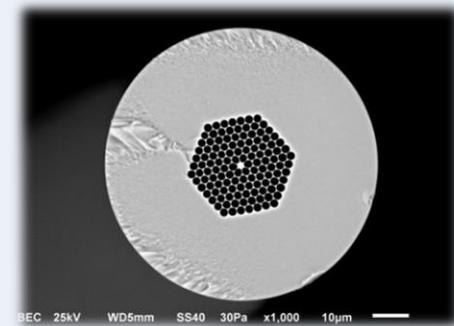




Our experience and achieved results

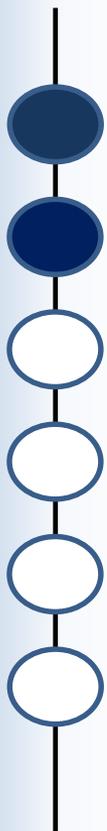


- Our team already participated in two previous COST Actions, which already ended:
 - **ICT COST Action IC1101** - *Optical Wireless Communications - An Emerging Technology (Opticwise)*
 - **ICT COST Action TD1001** - *Novel and Reliable Optical Fibre Sensor Systems for Future Security and Safety Applications (OFSeSa)*
- Our team is now present in one other COST Action, which is active:
 - **CA COST Action CA16220** - *European Network for High Performance Integrated Microwave Photonics*

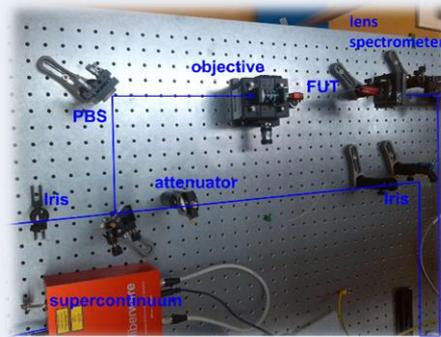
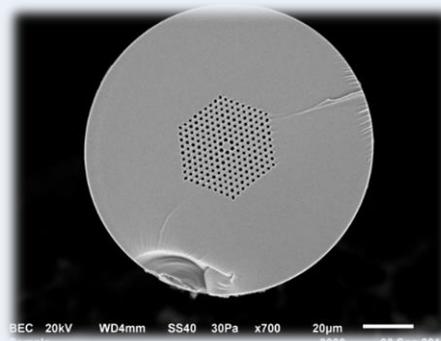
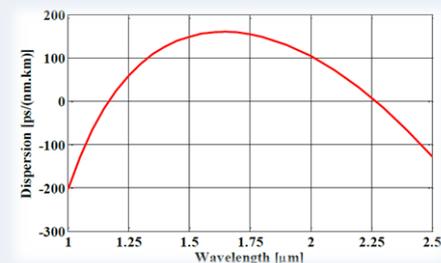




Our experience and achieved results

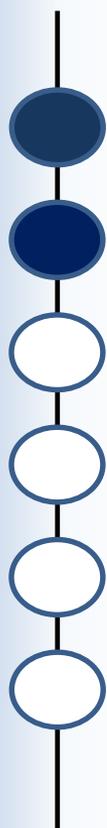


- **Research point of view** – significant gain of know-how, expertise in the framework of the EU Action
- **Cooperation** on the international but also national level
- **Personal enrichment point of view** – excellent for career speed-up for ESR (now ECI)
- **Perfect for PhDs** to carry out STSMs, meet other students on ITs, discuss their ideas, progress
- Substantial funding on the national level





National COST project



- **National project supporting COST MP1401 participation and research:**

COST CZ LD15083

- 10/2015-12/2017

- **Key members:**

- prof. Ing. Stanislav Zvánovec, Ph.D.
- doc. Ing. Pavel Hazdra, Ph.D.

- **Students:**

- Ing. Jan Bohata
- Ing. Tomáš Němeček
- Ing. Petr Chvojka
- Ing. Martin Sudík
- Ing. Dmytro Suslov
- Bc. Václav Hubata-Vacek

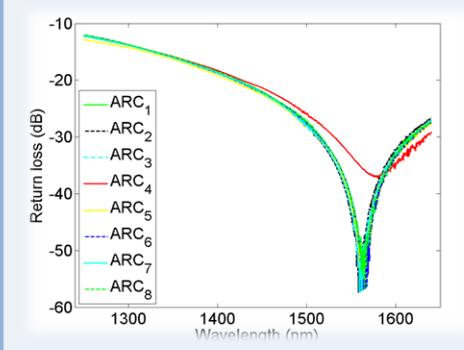
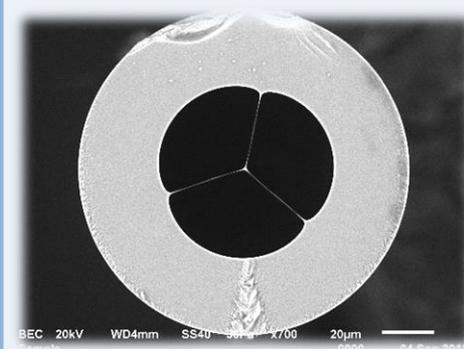
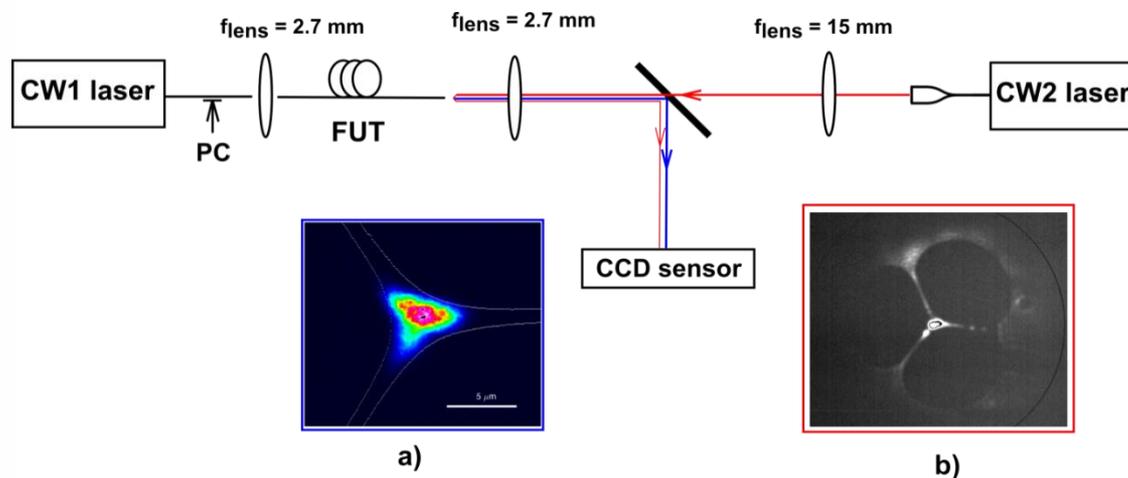




Our contribution in COST MP1401



- **Characterization methods** of specialty optical fibers for MIR lasers and applications
- **Technology procedures** of splice-less fiber connection, module preparation





Our contribution in COST MP1401



- **One STSM** hosted at our department with a follow-up 2-months stay
- **Three high-impact papers** within new international cooperations, both as STSM results
- **One conference paper** with 4 COST institutions from 3 COST countries

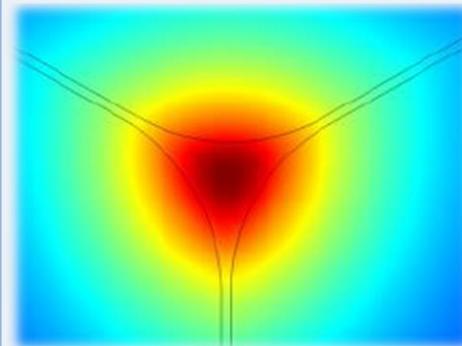
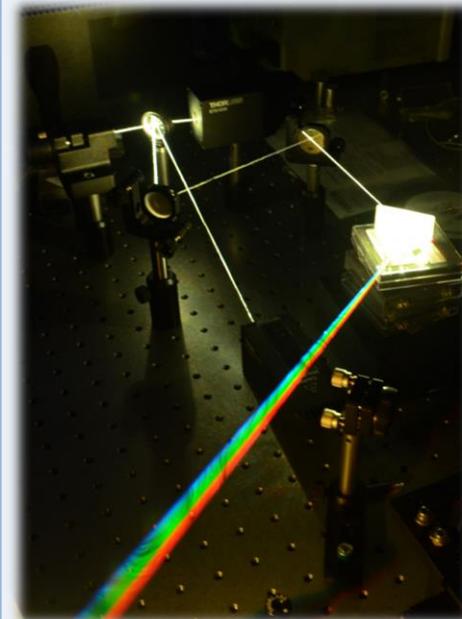
[1] R. Ahmad, M. Komanec and S. Zvanovec, "Circular Lattice Photonic Crystal Fiber for Mid-IR Supercontinuum Generation," in IEEE Photonics Technology Letters, vol. 28, no. 23, pp. 2736-2739, Dec.1, 1 2016. doi: 10.1109/LPT.2016.2615657

Impact factor: 2.375; **journal ranking: Q2**

[2] E. Romanova; S. Korsakova; M. Komanec; T. Nemecek; A. Velmuzhov; M. Sukhanov; V. Shiryayev, "Multimode Chalcogenide Fibers for Evanescent Wave Sensing in the Mid-IR," in IEEE Journal of Selected Topics in Quantum Electronics, vol. 23, no. 2, 2017, doi: 10.1109/JSTQE.2016.2630846

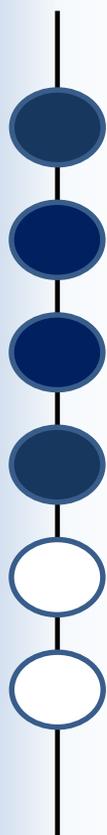
Impact factor: 3.971; **journal ranking: Q1**

[3] J. Bohata, M. Komanec, J. Spáčil, Z. Ghassemlooy, S. Zvanovec, R. Slavik, "24 - 26 GHz radio over fiber and free space optics for 5G systems ", Optics Letters, **journal ranking: Q1**

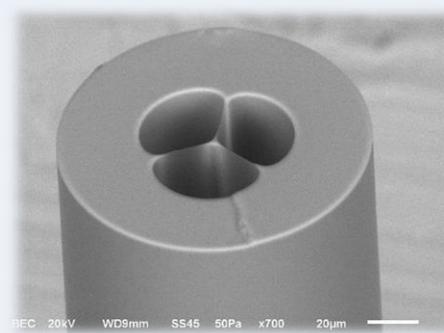
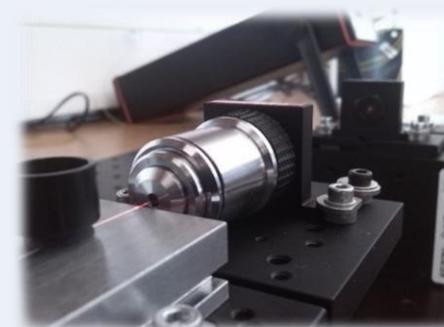
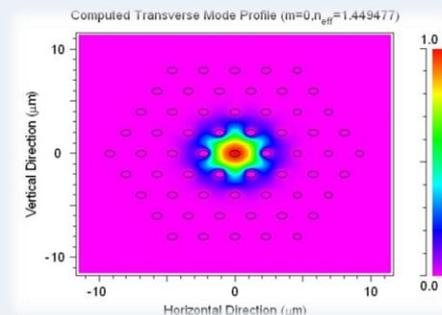




Benefits of the COST Action



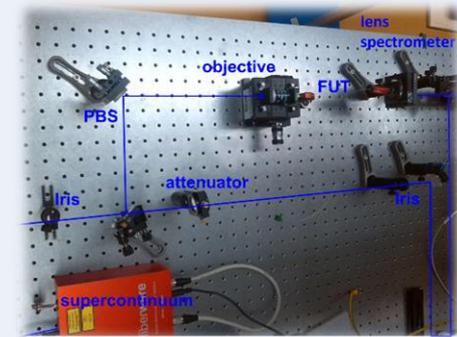
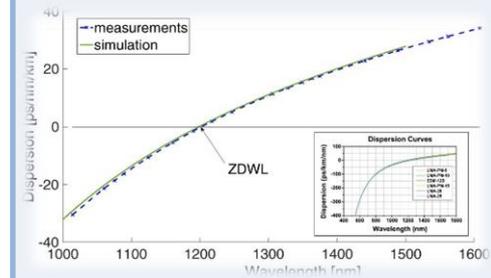
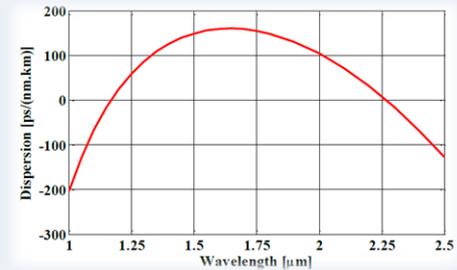
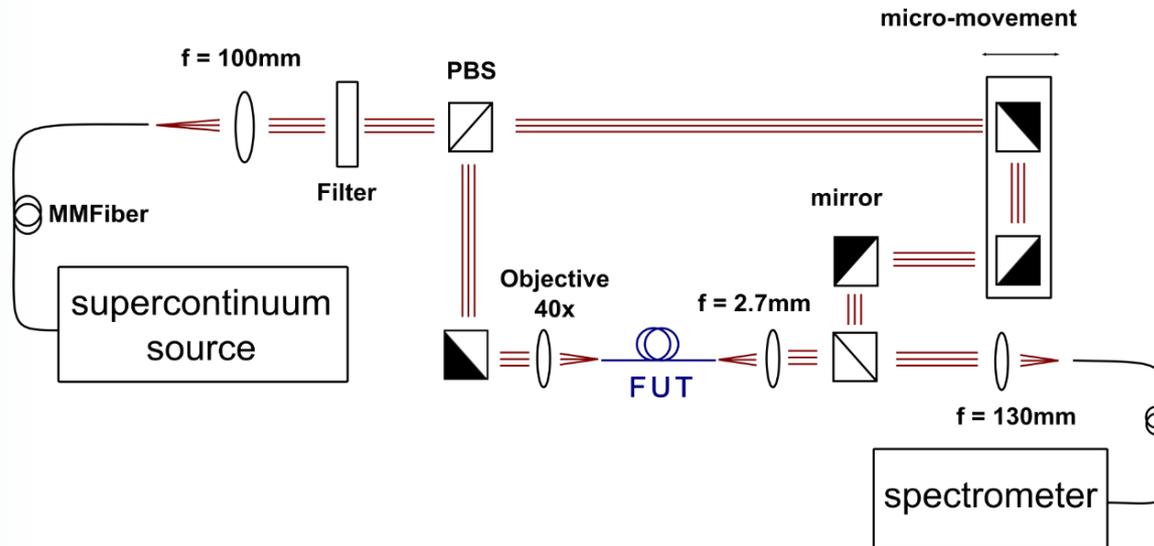
- We have at least **two new international** cooperations
- We significantly deepened one of our cooperations
- **3 STMS** (2 carried out + 1 hosted)
- We are in contact with **experts in the field**
- We are in contact with the **cutting-edge research**
- We are included in new-formed consortia (**H2020**, etc.)
- We carried out **experiments** with the partners
- We **published 3 high-impacted papers** [1-3]
- The world (at least EU) knows about us



International cooperation

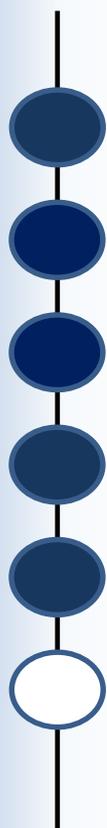
- **Specialty fiber characterization (Zwickau, DE):**

- STSM in 2016
- Photonic crystal fibers evaluation
- Precise modelling – theory vs. Experiment
- Broadband dispersion measurement
- **2 project proposals** submitted
- **1 conference paper** presented
- **1 impacted journal paper** being prepared



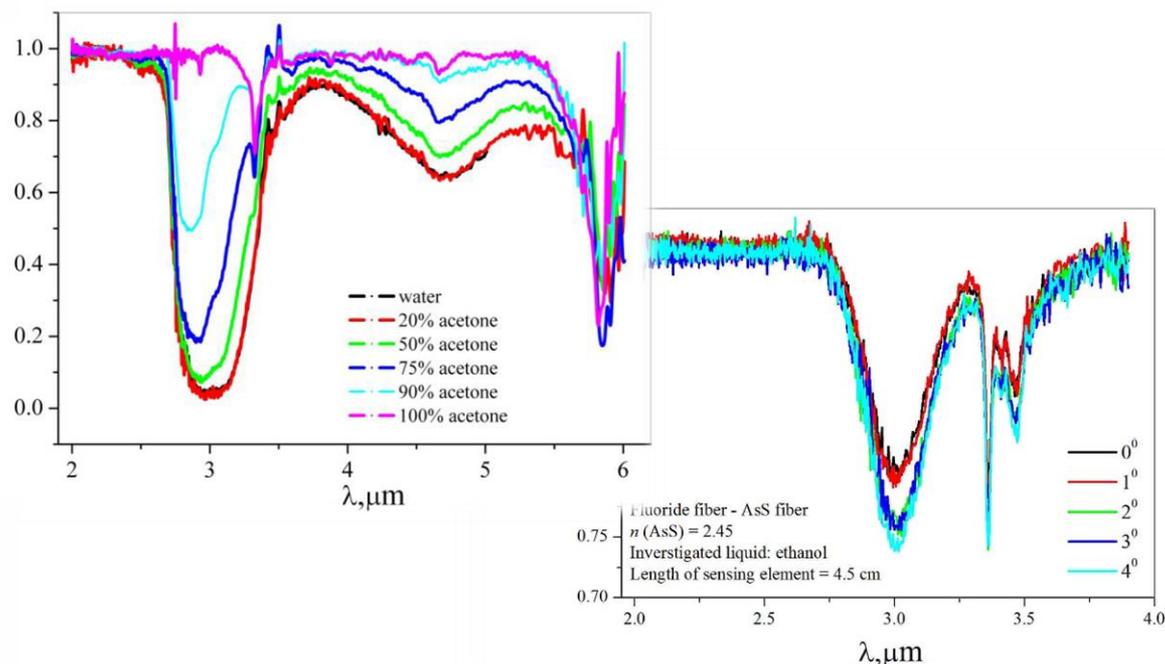


International cooperation



• Absorption evanescent spectroscopy (Saratov, RU):

- STSM in 2015, 2-months stay in 2017
- Utilization of MIR fiber, chalcogenide (Nizhny Novgorod)
- Theoretical description, experimental campaign



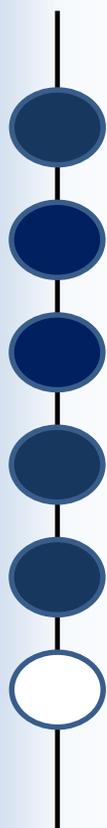
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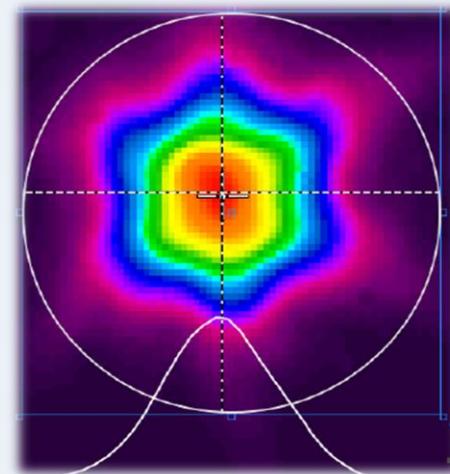
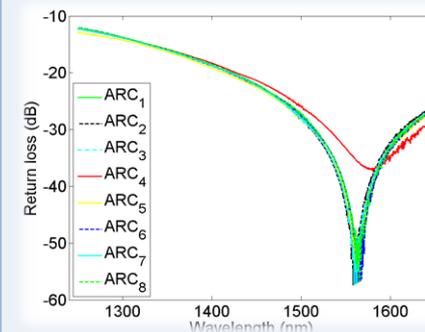
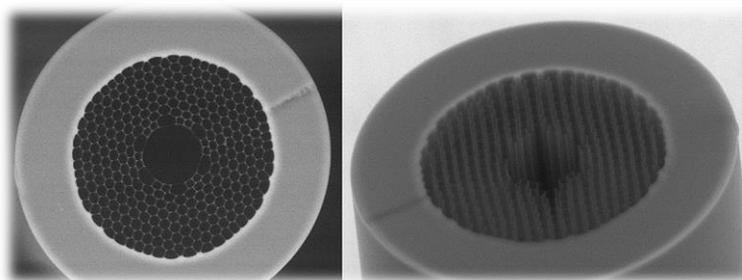
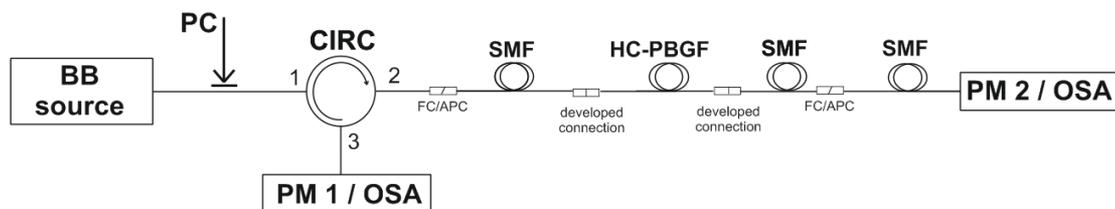




International cooperation



- **Hollow-core fibers (Southampton, UK):**
 - STSM in 2017
 - Hollow-core photonic bandgap fibers
 - Novel splice-less approach
 - Technology development
 - Ultra-stable lasers, radars, high-precision measurements

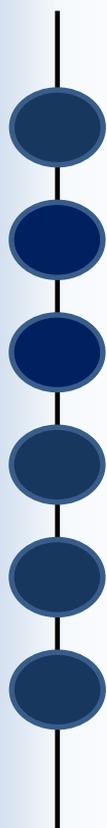


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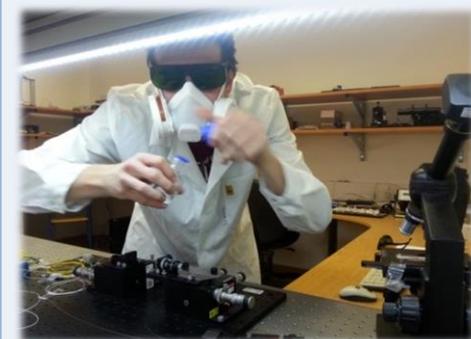
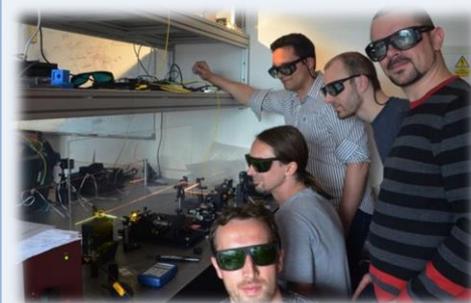




Summary



- We see COST Actions as the most effective tool for establishing **international cooperation**
- We formed **2 new collaborations** and supported 1 collaboration **via STSMs**
- We **hosted 1 STSM**, supported COST in technology and characterization of specialty optical fiber
- We participated in **COST management**
- We **published** several papers and attended conferences
- We **enriched our knowledge** substantially





Thank you.

