



PHOTONEXT: ACTION 3: COMPONENTI

Overall investment 750,000 € in equipment for:

- Multifunctional specialty optical fibers
- Test bench for silicon photonic integrated circuits
- Components for high power laser sources (→ Infra-P)

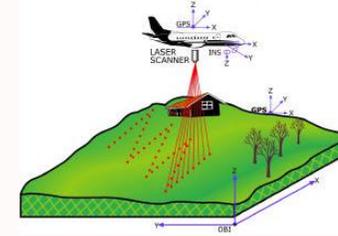
- Optical fiber splicer (including PM and LMA fibers)
- High precision optical fiber cleaver
- Optical spectrum analyzer (600 – 1600 nm)



Future plans: Possible synergy with the FIP (INFRA-P) research project proposal (outcome on Feb. 10):

- FBG writing setup
- High power laser beam characterization equipment
- Fiber processing equipment (micromachining, tapering, etc.)
- Thin film deposition equipment

- **Multifunctional specialty optical fibers:**



- Er, Yb and Yb/Er doped optical fiber power amplifiers for LIDAR applications

- With DATALOGIC:

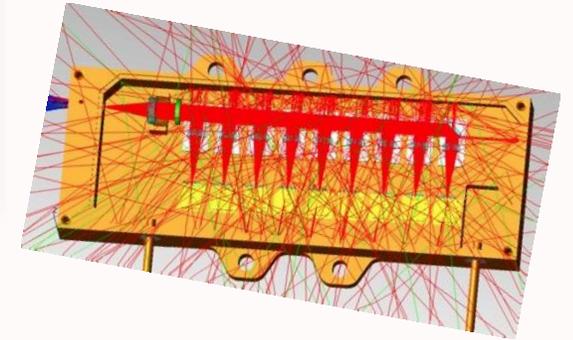
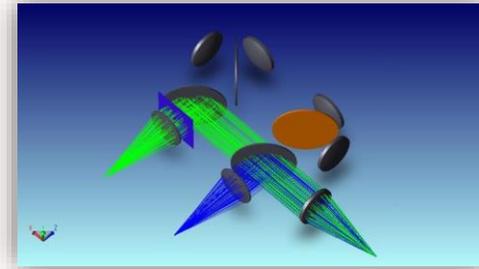
- Delivery of pulsed fiber lasers for micromachining and texturing of different materials
- Testing of commercial optical fibers for laser cavities



- **Silicon photonic integrated circuits**
 - Design of silicon photonic integrated circuits, including both passive and active (modulators, photodetector, lasers ...) components
 - Realise the designed circuits in Multi-Wafer-Project using a silicon photonic foundry
 - Characterization and testing of silicon photonic integrated circuits

■ Components for high power laser sources

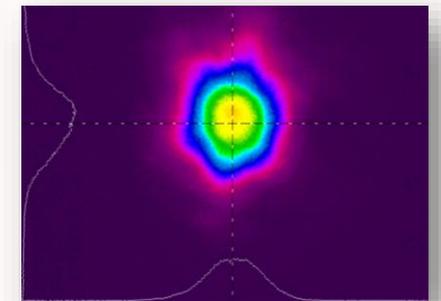
- High power beam combining architectures (free space kW beams and for multi-emitter diodes)



- High peak power (ps-fs pulses) fiber beam delivery systems



industrial grade cable based on innovative hollow core optical fibers



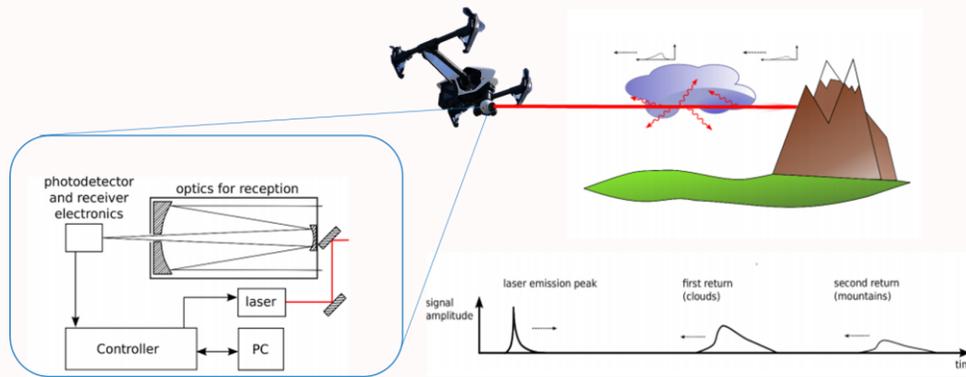
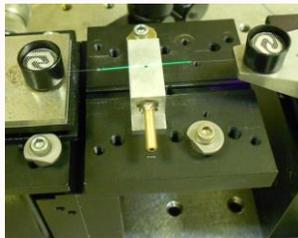
- CALIBER - CompAct eye-safe Lidar source for AirBorne lasER scanning (2017-2019) – funded by NATO
 - Project coordinator: Nadia Boetti (ISMB) – Lead scientist for PhotoNext: *D. Milanese*
- Supporting ISMB key projects on Airborne Lidar systems for Laser Zentrum Hannover and US Army
 - Project coordinator: Nadia Boetti (ISMB) – Lead scientist for PhotoNext: *D. Milanese*
- STAMP – “Sviluppo Tecnologico dell’additive Manufacturing in Piemonte”
 - D. Janner, D. Milanese (DISAT), G. Perrone (DET)
- BOREALIS – “The 3A energy class flexible machine for the new additive and subtractive manufacturing on next generation of complex 3d metal parts”
 - *G. Perrone*

- CISCO sponsored research agreements (2016-2018): photodetectors and laser sources for integration in silicon photonics platform
 - Gioannini, Ghione, Goano
- Europractice Stimulation Action (2017-2018) - Grant for First Silicon Photonic Fabrication
 - Project: flexible-grid switching architecture based on micro-ring resonators
 - Gioannini

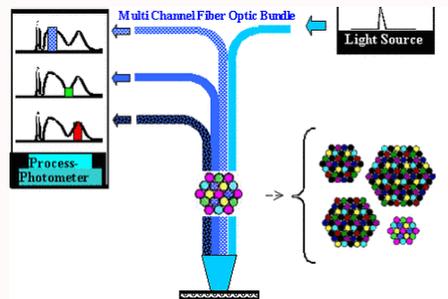
- H2020 - ITN Project “PHAST”
 - Project coordinator: Daniel Milanese – Partner: Nadia Boetti (ISMB)
- PRIN Projects – ongoing
- H2020 calls to be considered

- Boetti, Janner, Milanese et al. *Highly doped phosphate glass fibers for compact lasers and amplifiers: A review* (2017) Applied Sciences (Switzerland), 7 (12), art. no. 1295.
- Lopez-Iscoa, Boetti, Janner, Milanese et al., *Effect of the addition of Al₂O₃, TiO₂ and ZnO on the thermal, structural and luminescence properties of Er³⁺-doped phosphate glasses* (2017) Journal of Non-Crystalline Solids, 460, pp. 161-168.
- Ceci-Ginistrelli, Boetti, Milanese et al. *Drug release kinetics from biodegradable UV-transparent hollow calcium-phosphate glass fibers* (2017) Materials Letters, 191, pp. 116-118.
- Ceci-Ginistrelli, Boetti, Milanese et al. *Nd-doped phosphate glass cane laser: from materials fabrication to power scaling tests* (2017) Journal of Alloys and Compounds, 722, pp. 599-605.
- A.Palmieri; M. Vallone M. Calciati A. Tibaldi F. Bertazzi G Ghione M Goano, “Heterostructure modeling considerations for Ge-on-Si waveguide photodetectors”, Optical and Quantum Electronics, 50 (2), 2018
- M. Gioannini, A. Benedetti, P. Bardella, J. Bovington, M. Traverso, D. Siriani, P. Ghotoskar “Design of hybrid laser structures with QD-RSOA and silicon photonic mirrors”, to be published in SPIE Proceedings 2018.

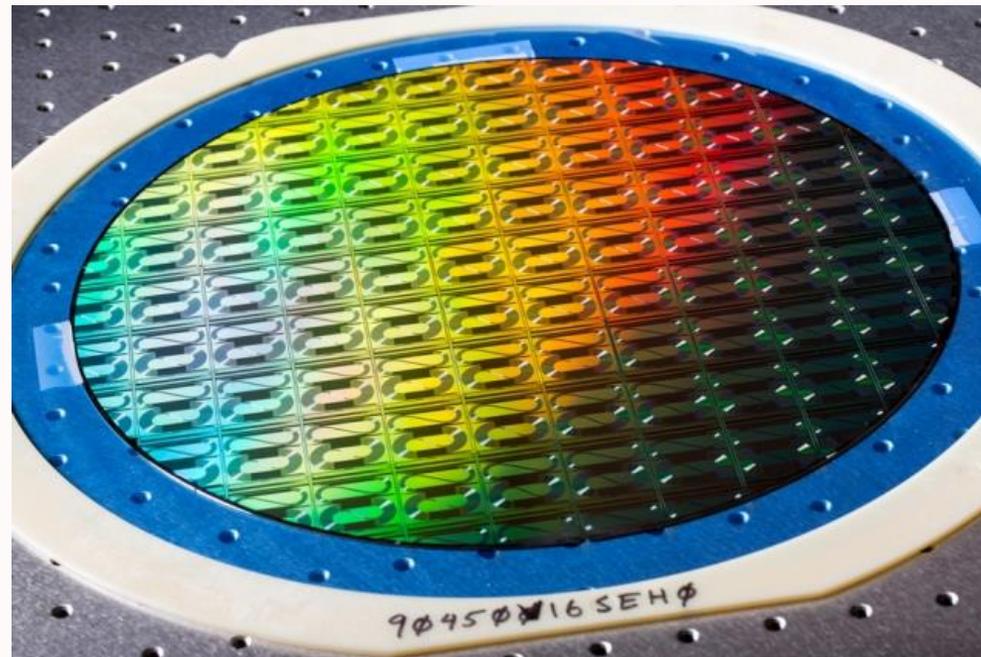
- To develop SOA optical fiber power amplifiers for aerospace applications



- To develop multifunctional optical fibers for theranostics



- Design, realize and test photonic integrated circuits with advanced optical functionalities in silicon photonics platform



PHOTONEXT

Grazie per l'attenzione!

Per ulteriori informazioni:

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LinkedIn

<https://goo.gl/PVx4GY>