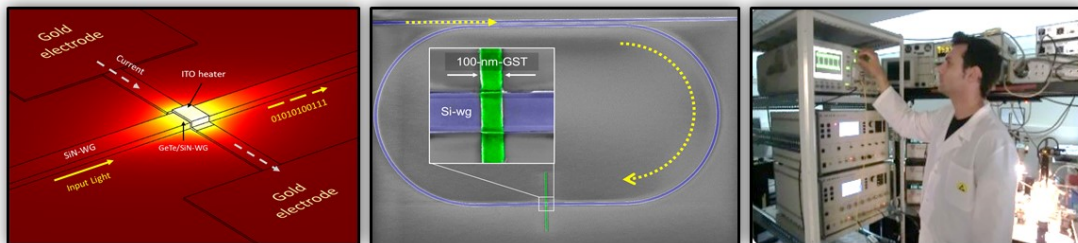


Description of the group

The [“Photonic Integrated Devices” group](#) is one of the seven research groups within the [Nanophotonics Technology Center](#) of the Universitat Politècnica de València. This group is led by Prof. Pablo Sanchis and is focused on the development of **high performance photonic integrated circuits, especially in the field of silicon photonics, for a wide range of applications** with special emphasis on the telecom/datacom sector.

The research group has a strong background on the development of passive and active silicon photonic devices. One of the main areas of expertise is the development of **silicon optical switches and modulators**. Furthermore, significant contributions have been made in the development of silicon photonic transceivers and switching matrices for on-chip communications.

The **integration of disruptive materials with silicon photonics** to enhance electro-optical and all-optical functionalities has become a key research activity in the group in the last years. We have made significant contributions for enabling novel ultra-compact switching devices based on phased change materials (VO_2 and recently GST) and transparent conducting oxides (ITO, AZO and CdO) as well as ultra-fast modulators based on Pockels coefficient (BTO and strained silicon technology).



Most of this work has been done in the context of R&D projects at European (FP6-ePIXnet, FP7-HELIOS, FP7- SITOGA, H2020-PHOXTROT, H2020-RETINA, H2020-L3MATRIX, H2020-ACTPHAST, H2020-PHOTONHUB) and National level (PID2019-NOVOPIC, TEC2016-METALONIC, TEC2012-LEOMIS, TEC2008-DEMOTEC), where we have a strong track record, as well as with several contracts with private companies. The group is also very active in collaborations with other national and international leading research groups.

Selected publications

1. J. Parra I. Olivares, A. Brimont, P. Sanchis, “Towards non-volatile switching in silicon photonic devices”, *Laser and Photonics Review*, 2000501-1/18, 2021.
2. J. Parra, W. H. Pernice, P. Sanchis, “All-optical phase control in nanophotonic silicon waveguides with epsilon-near-zero nanoheaters”, *Scientific Reports*, vol. 11, pp. 9474, 2021.
3. S. Cueff, J. John, Z. Zhang, J. Parra, J. Sun, R. Orobtcchouk, S. Ramanathan, P. Sanchis, “ VO_2 nanophotonics,” *APL Photonics*, vol. 5, no. 11, p. 110901, Nov. 2020.

4. G. Herranz and P. Sanchis “Functional oxides in photonic integrated devices”, Applied Surface Science, vol. 482, pp. 52-55, 2019.
5. S. Abel, F. Eltes, J. E. Ortmann, A. Messner, P. Castera, T. Wagner, D. Urbonas, A. Rosa, A. M. Gutierrez, D. Tulli, P. Ma, B. Baeuerle, A. Josten, W. Heni, D. Caimi, L. Czornomaz, A. Demkov, J. Leuthold, P. Sanchis, J. Fompeyrine, “Large Pockels effect in micro- and nano-structured barium titanate integrated on silicon”, Nature Materials, vol. 18, pp. 42–47, 2019.

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