REPORT NFO12

The 12th edition of the International Conference on Near-Field Optics, Nanophotonics and related techniques NFO-12, took place at **Kursaal Conference Center** in Donostia – San Sebastián, Spain, from September 2 to 7 of 2012, organised by Donostia International Physics Center DIPC and the Center for Nanoscience and Nanotechnology of the Basque Country nanoGUNE.

The attendance to the conference was **424 attendees**, coming from the following countries:

Germany	71 persons
Spain	71 persons
France	48 persons
United States	35 persons
Japan	31 persons
United Kingdom	25 persons
The Netherlands	14 persons
Italy	13 persons
Denmark	11 persons
Sweden	11 persons
Check republic	10 persons
China	9 persons
South Korea	9 persons
Austria	8 persons
Switzerland	8 persons
Russia	8 persons
Finland	5 persons
Israel	5 persons
Taiwan	5 persons
Poland	4 persons
Ucraine	4 persons
Belgium	3 persons
Brasil	3 persons
Mexico	3 persons
Ireland	2 persons
Singapore	2 persons
Australia	2 persons
Island	1 person
Turkey	1 person
Argentina	1 person

New Zeland 1 person

A total of **112 oral contributions** were presented in oral sessions. There were **290 poster** contributions presented in the three poster sessions in the evenings, and **37 invited talks** were given in the beginning of each topic session.

A company exhibition also took place in the venue of the conference during the whole conference that joined companies devoted to nanophotonics and optics. **9 companies** joined this exhibition with stands.

The first day of the conference a school took place at the Center for Nanoscience and Nanotechnology of the Basque Country, nanoGUNE. **115 attendees** attended this school (mainly PhD students in Physics and postdoctoral researchers). 5 invited lecturers gave lectures during the whole day about Optical forces, Quantum Optics, Near-field Optics, and Non-linear optics.

On the last day of the conference, a special session devoted to bionanophotonics took place at Kursaal Conference Center as part of the activities of NFO12, with more than 200 people attending the event.
All this information is summarized in the conference web page:

http://www.nfo12.org/en/home

The conference program covered many different aspects of Nanooptics. The full program of the oral sessions is displayed in the following page:

THE 12TH INTERNATIONAL CONFERENCE ON NEAR-FIELD OPTICS, NANOPHOTONICS AND RELATED TECHNIQUES

3/7 SEPT. 2012 DONOSTIA · SAN SEBASTIAN SPAIN

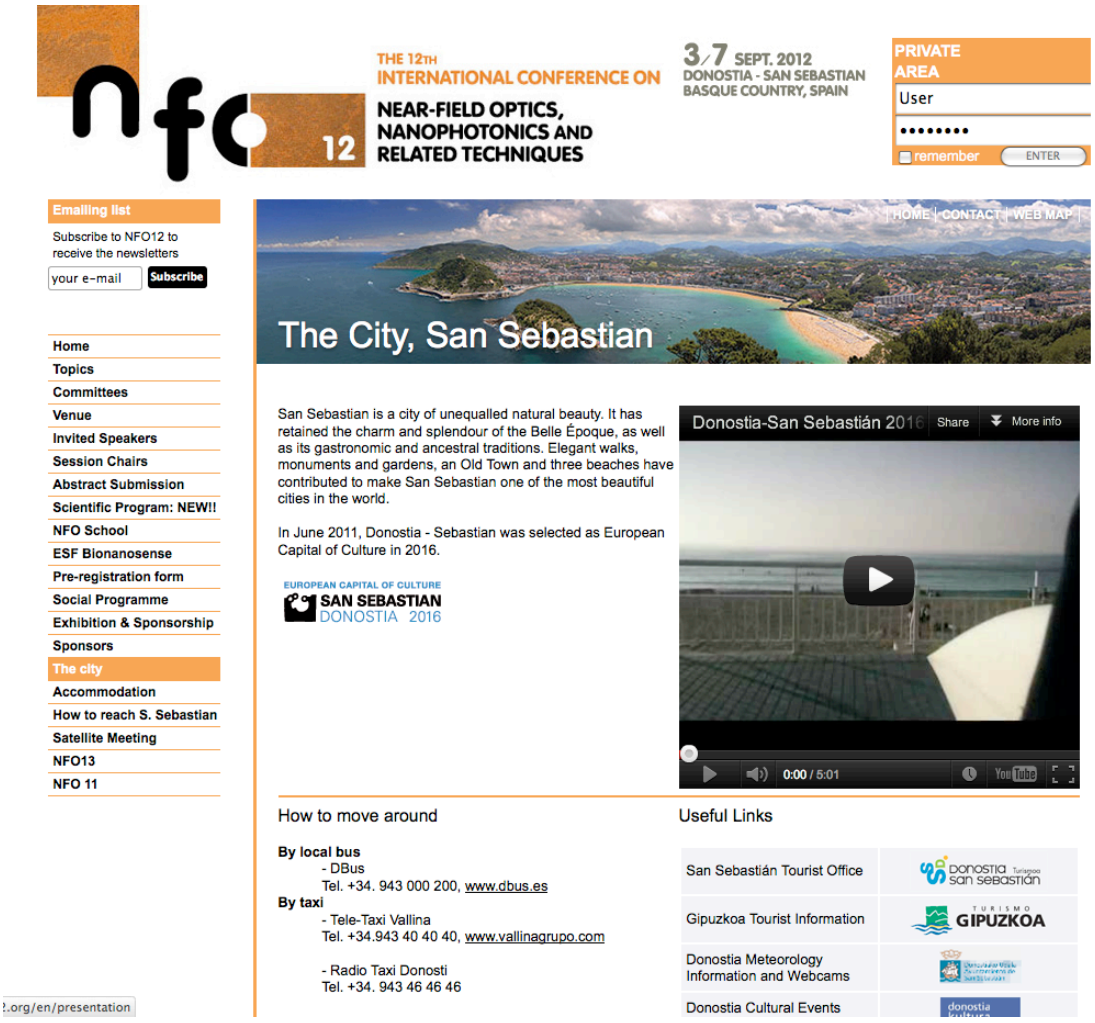
www.NFO12.org

Full program of NFO12. Details of the program at http://www.nfo12.org

	Monday Sep. 3rd		Tuesday Sep. 4th		Wednesday Sep. 5th		Thursday Sep. 6th		Friday 7th
	Session A	Session B	Session A	Session B	Session A	Session B	Session A	Session B	ESF
8:30-9:00	OFFICIAL OPENING		NEAR-FIELD MICROSCOPY Chair: D. Courjon	CHIRAL PLASMONICS Chair: A. Dereux	THZ AND INFRARED NEAR-FIELD MICROSCOPY Chair: C. Lienau	HYBRID PHOTONIC STRUCTURES Chair: J. Krenn	ACOUSTICS AND FORCES IN NANOOPTICS Chair: R. Bachelot	EMISSION Chair: A. Meixner	ESF 1 Chair: S. Maier **Maier:** New concepts for plasmonic biosensing based on hybrid plasmonic modes
9:00-9:30	OPENING TALK: **Lukas Novotny:** 20 years of NFO		**Hartschuh:** New directions in tip-enhanced near-field optical microscopy.	**Giessen:** Complex plasmonic nanostructures: moving towards applications	**Han:** Quantitative Spectroscopic Terahertz Near-Field Microscopes.	**Benson:** Fundamental Photonic Hybrid Systems based on Defect Centers in Diamond.	**Mlayah:** Acousto-Plasmonics sensing	**Koenderink:** Near-field measurement and manipulation of antenna-enhanced spontaneous emission	**Fritzsche:** Biosensing at the single particle level
	NANO-RAMAN Chair: F. Keilmann	NANOPHOTONICS Chair: O. Martin							
9:30-9:45	**Wickramasinghe:** Raman Probe Force Microscopy - a New Method to Detect the Raman Effect	**Di Fabrizio:** Nanostructures and their use in nano optics	Lewis: Near-field optical fluorescence correlation spectroscopy Kim: Stacking structures of multilayer graphenes revealed by infrared near-field microscopy	García de Abajo: Supercihral near fields: 'Twisted' hot spots in optical nanoantennas Klimov: Engineering of radiation from chiral molecules with chiral nano-meta-particles	Kim: Strong coupling between nano-slot antenna and nano-object below skin-depth limit Mitrofanov: Terahertz probe for spectroscopy of sub-wavelength objects	Vasa: Real-time observation of ultrafast Rabi oscillations between excitons and plasmons in metal-molecular hybrid nanostructures Celebrano: Assembly and manipulation of nanophotonic elements in a fluid: towards reconfigurable photonic structures on a chip	Arbouet: Intense optical near-fields and mechanical vibrations: femtosecond spectroscopy of large crystalline gold nanoparticles Yamazaki: Single molecule DNA analysis using a large electric field gradient at Si nanopore opening	Chen: Metallo-dielectric antennas for ultrastrong enhancement of spontaneous emission Dostalek: Plasmon-enhanced fluorescence for biosensor applications	**Krenn:** Tuning plasmon modes for biosensing
9:45-10:00									
10:00-10:15	Deckert: TERS Mapping of an (A10C15)8 DNA Single Strand	Halas: Nanoplasmonics applications: hot electrons, bubbles and whiskey	Decker: Mapping of single insulin fibrils with TERS	Narushima: Direct Imaging of Nanoscale Circular Dichroism	Jones: Thermal Near-field Optical Spectroscopy	Vitry: Near-field patterns and geometric resonances in heterogeneous nanoparticle arrays	Renaut: Optical tweezing with nanobeam coupled cavities	Kajihara: Nano-thermometry with a sensitive infrared near-field microscope	**Quidant:** Towards an integrated plasmonic platform for early cancer diagnosis
10:15-10:30	Hayazawa: Highly reproducible TERS as a tool for everyone	Curto: Magnetic and electric multipolar interactions with nanoantennas	Neogi: Nanoscale Strain mapping from active region of InGaN emitters	Hentschel: Three-dimensional chiral plasmonic oligomers	Albella: Quantitative evaluation of the electromagnetic mechanism of surface-enhanced light scattering at single hot spots	Leonetti: Mode-locking in disordered lasers	Nieto Vesperinas: Optical forces on small particles from partially coherent light. The near field of statistically homogeneous fluctuating sources	Sharadwaj: Electrical excitation of surface plasmons	
10:30-11:00	*Coffee Break*		*Coffee-Break*		*Coffee-Break*		*Coffee-Break*		*Coffee-Break*
	SCANNING PROBE MICROSCOPY Chair: J. Gerton	OPTICAL ANTENNAS Chair: H. Xu	TERS AND SERS Chair: V. Deckert	AMPLIFICATION AND QUANTUM EFFECTS Chair: J-J. Greffet	NONLINEAR NANOOPTICS Chair: W. Dickson	IMAGING Chair: D. Kim			ESF 2 Chair: N. Van Hulst
11:00-11.30	**Dong:** Plasmon mediated single molecular optoelectronics	**Yang:** Driving Resonances in Plasmonic Nanoantennas By Electrons and Photons	**Suh:** Nano-gap Enhanced Raman Scattering (NERS) controlled by DNA	**Stockman:** Spasing and Amplification in Plasmonic Nanosystems	**Bouhelier:** X(2) processes in electrically contacted optical gap antennas: second harmonic generation and optical rectification	**Dorfmüller:** Real-Space Imaging of Optical Nanoantennas by apertureless SNOM	**Discussion panel** Chaired by Naomi Halas and Kobus Kuipers		**Leosson:** New fabrication approaches in low-loss plasmonics and controlled self-assembly of metal nanostructures for biosensing
11.30-11.45	Meixner: Tip-enhanced near-field optical spectroscopy in a tunneling junction	Kern: Atomic-scale confinement of optical fields	Augié: Combined SPR and SERS spectroscopy on a flat metal surface	Pedyanin: Surface plasmon polariton amplification upon electrical injection: towards active plasmonic interconnects	Huttunen: Second-harmonic generation imaging of individual metal nano-objects with cylindrical vector beams	Le Feber: Towards a complete vectorial mapping of electromagnetic near-fields			**Hoeppener:** Single Sphere and Self-similar Colloidal Nanoparticle Antennas for Membrane Protein Imaging
11.45-12.00	Skarvada: Local diagnostics of defects in monocrystalline silicon solar cells	Martin: Optical transport in plasmonic break junctions	Ando: Surface-enhanced Raman nano-imaging of cellular transport pathways with endocytosed gold nanoparticles	Nordlander: Quantum Plasmonics and Plexcitonics	Barbosa: Design of a nanorod metamaterial for enhanced fast nonlinearities	Rachelot: Near-Field Characterization Based on Nanoscale Photo-Polymerization			
							FABRICATION. Chair: P. Guccdardi	FUNDAMENTAL NEAR-FIELD OPTICS. Chair: O. Keller	
12.00-12.15	Klein: Double-tip scanning near-field optical microscopy – instrumentation and application to plasmonics	Hohenau: Revisiting polycrystalline gold nanoparticles: optical near fields and dielectric function	Feldj: Revisiting surface enhanced Raman scattering on realistic lithographic gold stripes	Esteban: Quantum effects induced by tunneling in large plasmonic systems	Bertelot: Silencing of second harmonic in coupled antennas	Rewitz: Spectral-interference microscopy for characterization of functional plasmonic elements	Fischer: Near - field photo - chemical fabrication of chemical nanostructures	Carminati: Time-domain radiation by subwavelength sources: A new look at near-field optics	**Kill:** Nanoplasmonic biosensing – promises and problem
12:15-12:30	Lewis: Addressing the inverse problem of imaging: a noniterative exact solution for phase in Sweden	Zabala: Transport and sensing in the optics of plexctons at nanoparticle dimer nanocavities	Guccciardi: Polarization properties of SERS from randomly oriented molecules on gold nanowires	David: Nonlocal effects in plasmonic devices	Biagoni: Unraveling four-photon photoluminescence in gold nanoantennas	Gersen: Imaging individual gold nanoparticles through interferometric Cross-Polarization Microscopy	Umakoshi: Fabrication of near-field plasmonic tip by photoreduction for strong enhancement in tip-enhanced Raman spectroscopy	Greffet: Validity of macroscopic electrodynamics at the nanoscale for dielectrics	
12:30-12.45	Gréusard: The topography of light	Massiot: Sub-wavelength nano-antennas for efficient ultra-thin solar cells	Blum: Amide I Mode Missing in Tip-Enhanced Raman Spectroscopy?	Fernández-Transformation optics description of nonlocal effects in plasmonic	Abb: Interference and nonlinear response through coupling of higher order modes in asymmetric dimer antennas	Rotenberg: Understanding plasmon - single subwavelength hole interactions	Bragas: Nanofabrication and in situ optical characterization of plasmonic probe tips	Courjon: Does a single illuminated slit lead to interference-like fringes in the double-slit experiment?	Closing talk: **Van Hulst**
12.45-13.00							Härtling: IR optical properties of nanoantennas with photochemically narrowed gaps in the 1-nm-regime	Laverdant: Spatial coherence properties of surface plasmon polariton investigated by Young Slits experiment	
13.00-14:15	*Lunch*		*Lunch*				*Lunch*		Official closing
	IMAGING WITH ELECTRONS Chair: R. Vogelgesang	PLASMONIC WAVEGUIDING Chair: V. Sandoghdar	ULTRAFAST NANOOPTICS Chair: R. Quidant	GRAPHENE PLASMONICS Chair: Z. H. Kim			PLASMONICS FOR IMAGING Chair: D. P. Tsai	QUANTUM / ACTIVE NANOOPTICS Chair: P. Nordlander	
14:15-14.45	**Batson:** Plasmonic Forces Induced by Swift Electrons in Small Particles	**García Vidal:** Localized spoof surface plasmons in textured partides	**Aeschlimann:** Ultrafast optical control at the nanoscale	**Basov:** Dirac plasmon in graphene: spectroscopy and imaging			**Verma:** High-resolution optical imaging through plasmonics and beyond plasmonics	**Wrachtrup:** Near field imaging with single diamond defects	
14:45-15:00	Van Aken: Coupled surface-plasmons and Babinet complementarity	S. Zhang: Tailoring Dielectric Substrate for Metallic Nanowires toward High Performance Plasmonic Waveguiding	Hohenester: Ultrafast hot-electron emission from plasmonic nanoparticles	Nikitin: Plasmons get involved: resonant electromagnetic effects in graphene			Shirdel: Adiabatic nanofocusing on ultrasmooth single-crystalline gold tapers creates a nanometer-sized light source with few-cycle time	Poyli: Theoretical modeling of plasmonic sensing of Hydrogen intake in Palladium nanodisks	
15:00-15:15	Asenjo: Electron-beam interaction with plasmon evanescent fields: A new enhanced electron spectral microscopy	Klein: Interference of Airy surface plasmons	Brinks: Coherent Ultrafast Plasmonics with Nanoantennas	Thongrattanasiri: Colossal Plasmon Field Enhancement in Graphene Dimers			Schuck: Demonstrating Near-Ideal Near-Field Spectroscopic Imaging Probes	Yamaguhi: Active plasmon filter	
15:15-15:30	Lemke: Propagating and localized surface plasmons probed in a counter-propagating detection scheme	Volkov: Long-range dielectric-loaded plasmonic waveguides for integrated	Silies: Observing the localization of light in space and time by ultrafast second-harmonic microscopy	Beams: Graphene luminescence from tunneling electrons			Berweger: Light at the tip of a needle: Nanometer-femtosecond control of an optical wavepacket	Renger: Active plasmonics based on phase change materials	
15:30-15:45	**Polman:** Angle-resolved cathodoluminescence imaging Spectroscopy: deep subwavelength imaging of the modal dispersion of light	**Weil:** Controlling Surface Plasmons in Silver Nanowire Waveguides	**Petek:** Coherent imaging of surface plasmon dynamics by time-resolved photoelectron emission microscopy	**Koppens:** Graphene plasmonics			Rivelle: Near-Field Bowtie Nano-Aperture probe as nano-source for single molecule fluorescence excitation	Pardo: Light focusing at nanoscale level by magnetoelectric interference	
15:45-16:00							Lapin: Sub 20-nanometer single molecule imaging using mass fabricated pyramidal microstructures	Santusse: Remote excitation of single carbon nanotubes by propagating surface plasmons launched by a scanning source	
16:00-16.30	*Coffee-Break*		*Coffee-Break*				*Coffee-Break*		
	GRAPHENE PLASMONICS Chair: L. Martín Moreno	OPTICAL AND INFRARED ANTENNAS AND WAVEGUIDES Chair: H. Raschke	INFRARED SPECTROSCOPY Chair: A. Bragas	QUANTUM EFFECTS. Chair: L. Novotny			ELECTRICAL CURRENTS IN NANOOPTICS Chair: U. Fischer	SINGLE EMITTERS Chair: S. Maier	
16.30-17.00	**García de Abajo:** Graphene plasmonics: An atomically thin look into NFO	**De Wilde:** NSOM applications to plasmonics at infrared wavelengths	**Pucci:** Surface enhanced infrared spectroscopy	**Baumberg:** Capturing the Quantum Regime in Tunnelling Plasmonics			**Berndt:** Plasmons in single-atom and single-molecule junctions	**Lukin:** Nanophotonics meets quantum optics	
17.00-17:15	Fang: A Graphene-Antenna Sandwich Photodetector	Alonso: Experimental Verification of the Shift between Near-Field and Far-Field Peak Intensities in Plasmonic Nanoantennas	Govyadinov: Quantitative determination of dielectric properties of nano-structures by s-SNOM in two and three dimensions	Bechteler: Measurement of the quantum mechanic behavior of the nanoantenna-enhanced near field			Thunich: Sub-diffraction quantum interference control of electrical currents in nanodevices	Greffet: Nanoantennas for single photon emission	
17.15-17:30	Chen: Optical nano-imaging of gate-tuneable graphene plasmons	Sánchez Gil: Plasmonic Fano resonances become single-particle	Raschke: Ultrafast infrared near-field molecular nano-spectroscopy	Sonnefraud: Quantum statistics of surface plasmon polaritons in metallic stripe waveguides			Kern: Electrically connected resonant optical antennas	Geiselmann: 3D optical trapping and manipulation of a single NV center for LDOS mapping	
17:30-17:45	Manjavacas: Plasmon Blockade in nanostructured graphene	Huang: Plasmonic Mode Converter for Optical Impedance Matching and Nanoscale Light-matter Interaction	Bensmann: Near-field infrared microscopy with a broadband light source	Wu: Quantum Description of Charge Transfer Plasmon			Badicker: Light-induced electronic transport changes through metallic nanostructures	Lindfors: Coupling plasmonic structures to self-assembled quantum dots for engineering the optical properties of single photon emitters	
17:45-18:00	Otto: Dark surface plasmon modes coming to light, the history up to 1968	Pohl: Stacked optical antenna	Keilmann: Nano-FTIR of minerals in the phonon region	Drezet: Wave-particle duality for single surface plasmons propagating on a polycrystalline gold film			Piglosiewicz: Strong field acceleration and steering of ultrafast electron pulses from a sharp metallic nanoprobe	Cueff: Sub-lifetime Electrical Modulation of Lanthanide Emission	
			18.00 Group photo						
18.00-21.00	Poster Session 1		18.30 Poster Session 2				Poster Session 3		
20:30-23:00					Conference dinner				

Excursion to Bilbao

A professional company, LANKOR, has taken care of the secretariat of the conference. This has allowed the conference chairs, Javier Aizpurua and Rainer Hillenbrand to be able to focus on the program obtaining a state-of-the art set of speakers and attendees.
The company LANKOR, settled in Donostia-San Sebastián took care of the registration fees, web-design and maintenance, and all issues regarding attendees' needs and requirements, including support for accommodation and traveling issues.



The conference was covered by a professional communication company that took care of disseminating the information about the conference and the ESF sponsorship in the media.

After the conference, a satellite meeting was organised jointly with the Center for Photonic Sciences (ICFO) in Castelldefels, Barcelona. Three invited speakers and some resources were shared between both conferences:

According to the level of attendance (more than in any other edition of NFO conference), the quality of the program (state-of-the-art topics covered), the satisfaction from the attendees (social program and scientific interest), and the spirit of the conference (feedback from attendees), this edition of NFO-12 has been a complete success.