



European Materials Research Society

2024 Spring Meeting

May 27 - 31 / Strasbourg Convention Centre

SYMPOSIUM Q

Polaritonics for next generation materials I

Symposium Organizers:

Anoop THOMAS, Department of Inorganic and Physical Chemistry, Indian Institute of Science, India

Kei MURAKOSHI, Department of Chemistry, Faculty of Science, Hokkaido University, Japan

Michael RUGGENTHALER, Max Planck for the Structure and Dynamics of Matter, Germany

Tal SCHWARTZ (Main organizer), Department of Physical Chemistry, Tel Aviv University, Israel

**The Journal of
Chemical Physics**

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Monday May 27

Q01_Reactions in optical cavities I

MADRID 2 - GROUND FLOOR

Chairperson(s) : GARCIA-VIDAL Francisco j.

08:45	159	INV	Probing Polaritonic Chemistry by NMR	EBBESEN Thomas
09:15	2088		Reshaping asymmetric synthesis through the strong coupling regime: chiral molecules in chiral cavities.	RISO Rosario Roberto
09:30	1676		Vibrational Mode-Specific Reaction Enhancement Caused by Cavity-Coupled Thermal Infrared Radiation	KIM Zee Hwan
09:45	1686		Modulation of Photochromic Reactions through Electromagnetic Field Enhancement by Plasmons	UENO Kosei

Monday May 27

Q02_Reactions in optical cavities II

MADRID 2 - GROUND FLOOR

Chairperson(s) : KONO Junichiro

11:00	934		Increasing and decreasing reaction rates by selectively coupling molecular vibrations to photonic cavities	VERGAUWE Robrecht
11:15	2238		Modification of water dynamics under vibrational strong coupling from molecular dynamics simulations	SPEZIA Riccardo
11:30	1229		Catalyzing Chemical Reactions through Vibrational Strong Coupling via Surface Lattice Resonances	WEI Yu-Chen

Monday May 27

Q03_Spectroscopy and photophysics of polaritonic systems I

MADRID 2 - GROUND FLOOR

Chairperson(s) : UENO Kosei - WEICHMAN Marissa I

13:45	2102	INV	Simulation of energy transfer processes mediated by quantum fields	KOCH Henrik
14:15	2852		Optical cavity-mediated exciton dynamics and excitation energy transfer in photosynthetic light harvesting 2 complexes	WU Fan
14:30	2757		Third-order optical nonlinearity enhancement under strong coupling	WANG Kuidong
14:45	2379		Spectroscopy and dynamics of disordered matter under Vibrational Strong Coupling	DE LA FUENTE DIEZ Jaime
15:30	2299		Harvesting triplet excitons for enhanced emission using organic microcavities	GORDON Robert
15:45	1220		Enhanced transmission at the zeroth-order mode of a terahertz Fabry-Perot cavity	HAZRA Soumitra

Monday May 27

QP01_Poster session

ETOILE - FIRST FLOOR

16:30	01_1041	120	01_1041 Extraordinary electrical conductance through amorphous non-conducting polymers under the vibrational strong coupling	BISWAS Subha
16:30	02_1075	120	02_1075 Full Quantum Dynamics Simulation of Exciton Polariton Transport	KRUPP Niclas
16:30	03_1123	120	03_1123 Strong coupling interaction in Ge/SiGe multiple quantum wells	FAVERZANI Marco
16:30	04_1185	120	04_1185 Exploring Electrical Conductivity Across Spatially Separated Polymers under Vibrational Strong Coupling	S MONY Kavya
16:30	05_1223	120	05_1223 Optoelectronics Properties of 2D Materials under Strong Light-Matter Coupling	BHATT Pooja

16:30	06_1251	120	06_1251 Modification of electron transfer rate at electrodes by strong coupling	MURAKOSHI Kei
16:30	07_1304	120	07_1304 Infrared plasmonic properties of well-defined isolated graphene nanostructures	NOMOTO Naoya
16:30	08_1397	120	08_1397 Modulation of hydrogen evolution reaction rate by nanostructured electrodes	FUKUSHIMA Tomohiro
16:30	09_1398	120	09_1398 Evaluation of oxygen evolution catalytic activity on structured electrodes	ASHIZAWA Daiki
16:30	10_1404	120	10_1404 Gauge Invariant Truncated Models in Cavity Quantum Electrodynamics	OBZHIROV Anatoly
16:30	11_1407	120	11_1407 Photoisomerization of Azopyrrole from Weak to Strong Coupling Regime	GARG Pallavi
16:30	12_1438	120	12_1438 Quantum description of surface plasmon polaritons in the Coulomb gauge	MAURER Florian
16:30	13_1449	120	13_1449 Probing DNA melting behavior under vibrational strong coupling	TAO Weijian
16:30	14_1535	120	14_1535 High-harmonic generation driven by squeezed light	DE LA PENA RUIZ Sebastian
16:30	15_1654	120	15_1654 Exploring Near-Field Spectroscopic Properties and Controlling Phase Relaxation Dynamics in Exciton-Plasmon Strong Coupling Systems	TAKEUCHI Hiroki
16:30	16_1771	120	16_1771 Full-dimensional photodissociation quantum dynamics of NOCI molecules in the electronic strong-coupling regime	MELLINI Federico
16:30	17_1774	120	17_1774 Modification of Intramolecular Singlet Fission Dynamics with Strong Light-Matter Coupling	WALLNER Lisamaria
16:30	18_1940	120	18_1940 Revealing the Nature of High-Order Cavity Polaritons under the Coupling-Decoupling Transition	GODSI May
16:30	20_2037	120	20_2037 Non-reciprocal Terahertz surface plasmonic cavities	AUPIAIS Ian
16:30	21_2120	120	21_2120 Magnesium Plasmonic Array Fabrication with Nanosphere Lithography	PEHLIVAN Zeki Semih
16:30	22_2272	120	22_2272 Self-consistent Red Shift – an Alternative Feature of Light- matter Coupling?	HORAK Jacob
16:30	23_2442	120	23_2442 NMR Spectroscopy in Cavities	PATRAHAU Bianca

16:30	24_2479	120	24_2479 H-bond Chemical Exchange Rate Modification Enabled by Molecular Vibrational Polariton	YIN Guoxin
16:30	25_2520	120	25_2520 Exploring the multiple scattering of organic exciton-polaritons using interferometric imaging	SANDIK Gal
16:30	26_2542	120	26_2542 Real-time polaritonic electron-photon dynamics using ab initio QED coupled cluster	CASTAGNOLA Matteo
16:30	27_2544	120	27_2544 Insight from ab initio Polaritonics: Changes in Solute-Solvent Interplay	CASTAGNOLA Matteo
16:30	28_2557	120	28_2557 Modulation of Intramolecular Vibrational Energy Flow Pathways in the Vibrational Strong Coupling Regime	MONDAL Subhadip
16:30	29_2558	120	29_2558 Multifractality in the interacting disordered Tavis-Cummings model	MATTIOTTI Francesco
16:30	30_2591	120	30_2591 Does VSC alter chalcogen and hydrogen bonding?	BASCIL Sinan
16:30	31_2616	120	31_2616 Exploring gas-phase molecular polaritons	NELSON Jane
16:30	32_2697	120	32_2697 Bose-Einstein condensate of excitons and coupled phonon-rotor modes	VARZARI Alexandru
16:30	33_2735	120	33_2735 Towards new photochemistry with quantum electrodynamics coupled cluster theory	ANGELICO Sara
16:30	34_2743	120	34_2743 Single particle plasmonic nanocavity-exciton coupling with self-aligned nanoring doublets	CHUNG Kyungwha
16:30	35_2751	120	35_2751 Towards a Better Understanding of Cavity-Altered Chemistry: Probing the Trans-Cis Photoisomerization of Stilbene Under Electronic Strong Coupling	MCKILLOP Alexander
16:30	36_2784	120	36_2784 Crystallography, Charge Transfer, and Two-Photon Absorption Relations in Molecular Cocrystals for Two-Photon Excited Fluorescence Imaging	WANG Lingsong
16:30	37_3119	120	Environment-induced nonequilibrium steady states enhance cooperative effects in vibrational polaritons	KESSING Kevin
16:30	38_2997	120	38_2997 Selectively guiding excitation energy by collaborative light-matter coupling	TOPPARI Jussi
16:30	39_313	120	39_313 Searching for Elusive Spontaneous Raman Scattering from Vibrational Polaritons	COHN Bar

16:30	40_341	120	40_341 Tuning energy transfer in strongly coupled organic multilayer cavities	VALSALAN Parvathi
16:30	41_474	120	41_474 Molecular Dynamics Simulations of Enhanced Energy Transport in Organic Optical Microcavities	SOKOLOVSKII Ilia
16:30	42_536	120	42_536 Role of Symmetry in Charge Transfer Complexation under Vibrational Strong Coupling	JAYACHANDRAN Anjali
16:30	43_538	120	43_538 Chiral Terahertz surface plasmonic cavities	GRASSET Romain
16:30	44_540	120	44_540 The Effect of Exciton Reservoir on Strong Exciton Photon Coupling	BHUYAN Rahul
16:30	45_594	120	45_594 Stochastic Dynamics of Resonance Electronic Energy Transfer in Bi-Dimensional Overexcited Molecular Ensembles	AVRILLER Rémi
16:30	46_702	120	46_702 Anisotropic Exciton-Polariton in an Optical Microcavity	DHARA Avijit
16:30	47_800	120	47_800 Cavity QED: relativistic study	KOSHELEVA Valeriia
16:30	48_849	120	48_849 Understanding the role of chemical interface damping (CID) in tuning plasmon-exciton coupling	ALISHA Alisha
16:30	49_858	120	49_858 Chiral cavities: a study based on a simple theoretical model	BUSTAMANTE Carlos
16:30	50_930	120	50_930 Polarization-selective strong light-matter coupling in highly aligned perylene diimide layers	HERRMANN Niklas
16:30	51_3113	120	Plasmonic Vibrational Strong coupling for surface water molecules	LATHER Jyoti

Tuesday May 28

Q04_Novel geometries and materials for strong coupling I

MADRID 2 - GROUND FLOOR

Chairperson(s) : KIM Zee hwan

08:45	33	INV	New Experimental Platforms for Polariton Reaction Dynamics	WEICHMAN Marissa L
09:15	479		Ultrasmall and tunable TeraHertz surface plasmon cavities at the ultimate plasmonic limit	LAPLACE Yannis
09:30	864		Single-Molecule Plasmonic Strong Coupling in Break Junctions	HOFFMANN Norah

Tuesday May 28

Q05_Quantum materials in cavities I

MADRID 2 - GROUND FLOOR

Chairperson(s) : DE GIORGI Milena

11:00	1420		Towards fully integrated all-optical polariton logic devices and circuitry	MAHRT Rainer
11:15	1062		Electron-Photon Exchange-Correlation Approximation for Quantum-Electrodynamical Density-Functional Theory: Renormalization and Correlation Contributions	LU I-Te
11:30	1886		Quantum vortex formation in the "rotating bucket" experiment with polariton condensates	SIGURDSSON Helgi
11:45	2309		Quantum theory for non-linear effects in the ultra-strong light-matter coupling regime.	KRIEQUER Thomas

Tuesday May 28

Q06_Reactions in optical cavities III

MADRID 2 - GROUND FLOOR

Chairperson(s) : AVRILLER Rémi

13:45	391	INV	The Effects of Vibrational Strong Coupling on Crystallization and Reactions	HIRAI Kenji
14:15	1339		Strongly coupled nanoscale plasmon-exciton hybrid for improved photocatalytic efficiency	CHANDRA Manabendra
14:30	486		Resonance Theory and Quantum Dynamics Simulations of Vibrational Polariton Chemistry	HUO Pengfei
14:45	566		Controlling Supramolecular Polymerization by Vibrational Strong Coupling	JOSEPH Kripa Merin

Tuesday May 28

Q07_Cavity-enhanced transport I

MADRID 2 - GROUND FLOOR

Chairperson(s) : GENES Claudiu

16:30	2723	INV	Cavity-modified transport and topology of 2D materials	CIUTI Cristiano
17:00	2935		Polariton-assisted hopping in amorphous non-conducting polymers	HAGENMULLER David
17:15	1621		Coherent transient exciton transport in disordered polaritonic wires	AROEIRA Gustavo
17:30	1435		Disorder-enhanced transport in a chain of lossy dipoles strongly coupled to a multimode cavity	ALLARD Thomas

Wednesday May 29

Q08_Cavity-enhanced transport II

MADRID 2 - GROUND FLOOR

Chairperson(s) : HUO Pengfei - ORGANIZERS #N/A

08:45	1399	INV	Polaritronics: Controlling Energy/Electron Transport by Strong Light-Matter Coupling	GEORGE Jino
09:15	473		Molecular Dynamics Simulations of Enhanced Energy Transport in Organic Optical Microcavities	SOKOLOVSKII Iliia
09:30	1391		Vibrational strong coupling of water for the modulation of ionic conductivity	FUKUSHIMA Tomohiro
09:45	1358		Extended hybridization and energy transfer in multimaterial polaritonic metasurfaces	BELLESA Joel

Wednesday May 29

Q09_Novel geometries and materials for strong coupling II

MADRID 2 - GROUND FLOOR

Chairperson(s) : MURAKOSHI Kei

10:30	2963	INV	Hybrid exciton-photon states in 2D semiconductors for the realization of nonlinear polariton devices	DE GIORGI Milena
11:00	2537		Polariton Dispersion in Plasmonic Supercrystals	BARROS Eduardo
11:15	2176		Developing Solution-Processed Distributed Bragg Reflectors for Microcavity Polariton Applications	PAPACHATZAKIS Michael
11:30	2020		Thin Film Plasmonic Supercrystals as Polaritonic Materials	SCHULZ Florian
11:45	1145		Fabrication and Optical Properties of Discrete Plasmonic-Excitonic Heteroparticle Nanostructures Self-Assembled Through Oligonucleotide Hybridization	KOLOMOISKY Shon

Wednesday May 29

Q10_Novel modeling approaches for confined light-matter interactions

MADRID 2 - GROUND FLOOR

Chairperson(s) : HOFFMANN Norah - SPEZIA Riccardo

14:15	1359	Cavity-Born-Oppenheimer Hartree-Fock: Vibronic-Strong- Coupling beyond a single molecule	SCHNAPPINGER Thomas
14:30	993	Nonresonant Electron-Photon Interactions in Vibro-Polaritonic Chemistry via Perturbation Theory	FISCHER Eric W.
14:45	598	Ab initio calculations of quantum light-matter interactions in general electromagnetic environments	SVENDSEN Mark Kamper
15:00	1401	Relativistic linear response QEDFT	KONECNY Lukas
15:15	1805	Molecularly Detailed View of Strong Coupling in Supramolecular Plexcitonic Nanohybrids	PAROLIN Giovanni

Thursday May 30

Q11_Quantum materials in cavities II

MADRID 2 - GROUND FLOOR

Chairperson(s) : RUGGENTHALER Michael

10:30	2380	INV	Engineering quantum Hall electronic states by cavity vacuum fields	FAIST Jerome
11:00	337		Topological polaritons in strongly-coupled light-matter systems	WEICK Guillaume
11:15	545		Quantum Hall Physics in a Cavity	ROKAJ Vasil
11:30	2684	INV	Controlled Quantum Materials	FAUSTI Daniele

Thursday May 30

Q12_Spectroscopy and photophysics of polaritonic systems II

MADRID 2 - GROUND FLOOR

Chairperson(s) : BELLESSA Joel - KESHAVAMURTHY Srihari

13:45	215	INV	Synchronization, Excitons, and Polaritons in Chemical Systems	SCHOLES Gregory
14:15	67		The role of cavity induced polarization effects under vibrational strong coupling	SIDLER Dominik
14:30	280		Modulation of intramolecular vibrational energy flow in an optical cavity	KESHAVAMURTHY Srihari
14:45	1146		Modified Kinetics in a Strongly-Coupled Organic Microcavity Containing a Multi-Resonance TADF Emitter	ISHII Tomohiro
15:00	631		Hot carrier generation in a strongly coupled molecule-plasmonic nanoparticle system	ANTOSIEWICZ Tomasz
15:15	288		The nature of excited states relaxation in plexcitonic materials	PERUFFO Nicola
15:30	1976		Identifying the origin of delayed electroluminescence in a polariton organic light-emitting diode	QURESHI Hassan Ali

Thursday May 30

Q13_Reactions in optical cavities IV

MADRID 2 - GROUND FLOOR

Chairperson(s) : THOMAS Anoop

16:30	1528	INV	Analysis of cavity-modified reactivity and solvatochromism	SIMPKINS Blake
17:00	2342		Ultra-fast photochemistry in the strong light-matter coupling regime	TIAINEN Ville
17:15	2478		H-bond Chemical Exchange Rate Modification Enabled by Molecular Vibrational Polariton	YIN Guoxin
17:30	1889		Making ab initio Polaritonics accessible: Machine Learning and Field-Quantization in Ensembles	SCHAEFER Christian
17:45	3068		Sub-picosecond collapse of molecular polaritons to pure molecular transition in plasmonic photoswitch-nanoantennas	ROMANELLI Marco
18:00	2984		Investigating cavity-control of chemical reactions: A study of Blackbody Infrared Radiative Dissociation under vibrational strong coupling	SUYABATMAZ Enes
18:15	3067		London dispersion forces and Solvent Polarity under Vibrational Strong Coupling	PIEJKO Maciej