

DELIVERABLE D4.1.2

ORGANIZATION OF THE SECOND

QUIE²T INTERNATIONAL CONFERENCE

Following the first QIPC conference organized in Zurich in 2011, another major interdisciplinary, international QIPC conference was organized within the QUIE²T Coordination Action program in 2013. Its main objective was to promote multidisciplinary research and integration of approaches, as well as expansion to new fields and applications. In addition to the scientific program, the conference comprised sessions that were of interest beyond the scientific community, and that continued the tradition of similar activities at earlier QIPC conferences.

Adjusted to the vocation of QUIE²T, these activities included an 'Industry Session', an 'EU funding session' and the ceremony for the 'QIPC Young Investigator Award'.

The

International Conference on Quantum Information Processing and Communication QIPC 2013

was held at the University of Florence from June 30 to July 5, 2013. The Conference program included 30 invited talks, 55 contributed talks and more than 90 poster presentations covering a broad range of topics on quantum information and quantum communication, physical realizations of quantum systems for information technologies and topical subjects such as quantum enhanced measurements, foundations of quantum information, quantum simulations and many-body systems.

In an industry sessions with three invited speakers, insights into the commercial developments of current and future quantum were given. Funding opportunities and future strategies were presented in a funding session featuring national and EU funding experts. A special session open to the public provided an insight on how to disseminate Quantum Information Science and Technology to a general audience.

The conference brought together scientists from 28 different countries. More than 120 different universities and institutes and funding agencies such as the European Commission were represented.

The conference was hosted by the University of Florence and supported by the EU Coordination Action QUIE2T (Quantum Information Entanglement-Enabled Technologies), the CNR-INO institute of Florence, the EU Projects Q-ESSENCE, SIQS and SOLID.

More detailed information about the Conference is available on the website:

<http://www.cqstar.eu/QIPC/>



QIPC 2013 SCHEDULE

QIPC 2013 SCHEDULE

	June 30	July 1	July 2	July 3	July 4	July 5
8:30-8:45		Registration	Registration	Registration	Registration	Registration
9:00		101 Chair: A. Smerzi	101 Chair: F.S. Cataliotti	101 Chair: M. Bellini	101 Chair: M. Inguscio	101 Chair: P. Mataloni
9:00		G. Rempe	I. Bloch	I. Wainsley	T. Pfau	E. Polzik
9:45		S. Clark	C. Kraus	D. Hume	S. Montangero	L. Di Carlo
10:15		Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
10:45		101 Chair: E. Giacobino	101 Chair: G. Toth	101 Chair: P. Cappelaro	101 Chair: T. Pfau	101 Chair: J. Flurištek
10:45		G. Leuchs	J. Catán	E. Giacobino	N. Gisin	C. Klempt
11:15						S. Bose
11:30		F. Sclarrino	H. Weinfurter	H. Wiseman	P. Grangier	K. Banaszek
11:45						
12:15		Lunch	Lunch	Lunch	Lunch	Lunch
13:00		Poster session (odd numbers)	Special session 101 Chair: I. Bloch	Poster session (even numbers)	Poster session (odd numbers)	Poster session (even numbers)
13:30			T. Lanting (teleconference) M. Troyer			
13:30						
14:00						
14:30		Four parallel sessions	Four parallel sessions	101 Chair: T. Arecchi	Industry Session 101 Chair: N. Gisin	Four parallel sessions
14:30		Rooms: 001, 101, 108, 109 (see schedule below)	Rooms: 001, 101, 108, 109 (see schedule below)	P. Kwiat	D. Hayford	Rooms: 001, 101, 108, 109 (see schedule below)
15:00				T. Aci	D. Kisliakov	
15:15					F. Reinhard	
15:30		Coffee break	Coffee break		Coffee break	Coffee break
16:15		101 Chair: G. Wendin	101 Chair: S. Bose		EU Funding Session Chair: T. Calarco	101 Chair: P. Grangier
16:45		I. Siddiqi	A. Gorshkov		J. Ellis	V. Giovannetti
16:45					I. Vergara-Ogando	T. Kippenberg
17:15					Final discussion	
17:30		P. Cappelaro	S. Pascazio			
18:00	Welcome Cocktail in Arcetri			Quantum Envoy comes to Florence Auditorium S. Apollonia Chair: F. Bagnoli		
18:00				T. Pfau		
19:00				P. Kwiat		
19:30				Cocktail		
20:00-21:00					Conference Dinner 20:00 Villa La Quiete	
21:00-22:00						

Colors Invited introductory 45' Invited topical 30' Contributed talks Poster sessions Young Investigator Award Other events

QIPC 2013, SCHEDULE PARALLEL SESSIONS

QIPC 2013, SCHEDULE PARALLEL SESSIONS

		Monday, July 1	Tuesday, July 2	Friday, July 5
Quantum enhanced measurements	14:30	108 Chair: W. Li J. Chwedenczuk, M. Dall'Arno, J.J. Garcia-Ripoll, E. Ginossar, L. Pezzé		001 Chair: F. Marin C. Bonato, A. Pontin, C. Ockeloen, L. Zhang
Quantum theory foundations and quantum information	14:30		101 Chair: J. Chwedenczuk J.F. Barra, F. Schaefer, J. Wolters, Z.-Q. Zhou, G. Gualdi	
Quantum simulation	14:30	109 Chair: F. Minardi A. Alberti, A. Beige, S. Campbell, M.J. Piotrowicz		101 Chair: C. Toninelli D. Rossini, C. Sias, L.-S. Xu, F. Caruso
Quantum communication and computing	14:30	101 Chair: A. Zavatta M.R. Sprague, G. Ferrini, A. Fedorov, J. Eisert, G. Adesso	001 Chair: M. Stobinska E. Diamanti, N. Cerf, J. Laurat, P. Ledingham, C. Wunderlich	108 Chair: C. Fort P. Peddibhotla, M. Pierre, A. Reiserer, B. Albrecht, M. Stobinska
Entanglement and non-classical states	14:30	001 Chair: G. Roati G. Tóth, C. Navarrete-Benlloch, N. Fabbri, N. Kristiansen	109 Chair: J. Catani M. Gramegna, T. Iskhakov, M. Genoni, H. Bernien	109 Chair: M. Agio B. Sanguinetti, R. Thew, D. Vitali, S. Weber, K. Hammerer
Quantum information and communication	14:30		Room: 108 Chair: R. Fazio A. Lucia, G. Vallone, F. Schmidt-Kaler, M. Rizzi, D. Sych	

In the scientific program were also a number of extra-scientific events that testify to the diversity and liveliness of the community:

Special session on practical quantum computing

A special session on the practical simulation of a quantum computer took place on Tuesday, July 1, 13:30-14:30. The session was chaired by I. Bloch and included a teleconference with T. Lanting from D-WAVE followed by the talk from M. Troyer of ETH Zurich on “Experiments on the D-Wave devices: quantum annealing on 500 qubits?”.

Industry session

After the successful Industry Sessions hold at the previous QIPC meetings in Barcelona’07, Rome’09 and Zurich 2011, this year’s Industry Session offered a platform for exchanges between academic researchers and industry leaders. The session took place on July 4, 14:30-16:00 and was chaired by Nicolas Gisin.

On the industry side, we heard Dr. Don Hayford, Senior Research Leader in National Security Global Business at Batelle (USA), and Mr. Dmitri Kisliakov, member of the Quantum Wave Fund Investment Team (USA). In particular, Don Hayford talked about “A Trusted Node QKD Network”, whereas Dmitri Kisliakov delivered a presentation on “A ‘Quantum’ Investment Fund”

On new and promising potential applications of quantum technologies we had the young researcher Dr. Friedemann Reinhard from the University of Stuttgart (Germany) who held a talk on “Commercial Applications of Quantum Magnetic Field Sensors”.

Special session *Quantum Envoy comes to Florence: What is “Quantum”, really?!*

Quantum Envoy is a special program from QUIE2T aimed at the dissemination of Quantum Information Science and Technology to a general audience.

A special session, open to the public, was organized in at the Auditorium S. Apollonia, located inside the former Benedictine convent of Sant'Apollonia, which was founded in 1339 and later enlarged in the 15th century. The Auditorium belongs to the Region of Tuscany and its use is shared with the University of Florence.

For the session organization we had the help of Kamna Pruvost who runs the Quantum Envoy programme in Oxford. We also relied on the SciCafè program of FP7.

The session was chaired by F. Bagnoli, the Italian coordinator of SciCafè, and staged two lectures with ample space for discussion.

The first lecture was delivered by T. Pfau from the University of Stuttgart and was dedicated to introducing quantum superpositions. It also staged a demonstration of interference using sound waves.

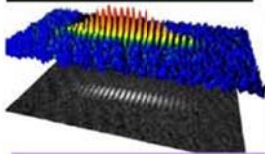
The second lecture was dedicated to the nature of light with many practical demos and was delivered by P. Kwiat from the University of Illinois.



QIPC 2013 - Quantum Information
Processing and Communication
FLORENCE, JUNE 30 - JULY 5 2013



The Quantum
Envoy comes
to Florence!!

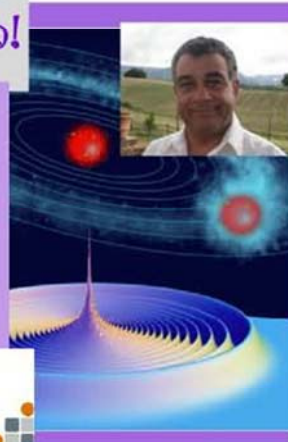


The
Quantum
Revolution!

Auditorium S. Apollonia
V. S. Gallo 25, Florence
July 3, 2013
Chair: F. Bagnoli
18:00-18:40 Tilman Pfau
18:40-19:20 Paul Kwiat
Cocktails
All welcome,
especially non-
physicists!



uie²t.
QIPC in Europe



Young Investigator Award

The QIPC Young Investigator Award was presented to outstanding young researchers in the field of Quantum Information Processing and Communication during the QIPC international conference in Florence, on **July 4, 2013, at 16.30-17.00**. The award consists of a diploma and a lump sum of 4000€.

The

2013 European Quantum Information Young Investigator Award

has been awarded jointly to:

Dr. Fernando Brandao - *For his highly appraised achievements in entanglement theory, quantum complexity theory, and quantum many-body physics, which combine dazzling mathematical ability and impressive physical insight;*

and to

Dr. Patrick Joachim Windpassinger - *For his broad experimental work in the field of quantum information processing, and especially for his recent achievements in the context of magnetism and synthetic gauge fields, which stand at the forefront of exciting developments in quantum simulation with cold atoms in optical lattices.*

The award ceremony was hosted by Prof. Massimo Inguscio, who briefly introduced the two awardees, and presented them with their diplomas. This was followed by a short presentation of the work of the two prize winners.



EU funding session

A special session on EU funding took place on Thursday, July 4, 17:00-18:00. In this session funding opportunities and future strategies for Quantum Technologies in Horizon 2020 were presented by Julian Ellis. Insights in the possibilities of the scientific and industrial community of QIPC to grow within the European Research Area were given by Janne Salo from ERC, and Isabel Vergara-Ogando from the European Commission. The session was chaired by Tommaso Calarco.

Conclusion

The QIPC 2013 conference in Florence continued the highly successful series of conferences that were initiated by the FP6 Coordination Action program QUROPE, and therefore assured a continuous coverage of major QIPC events in Europe every two years. The international QIPC conferences have a more than ten year tradition by now, and it is clear already that they are essential for the future development of the field.

This year has to be considered as exceptional for the QIPC community as two of the founding fathers of the field received the Nobel Prize in physics. The results presented at the conference covered European as well as overseas developments. We were quick to react to the upsurge of interest sparked in the news by the appearance of commercial products such as the DWAVE Computer. The Special session staged on Tuesday was indeed among the most attended. The Universal Quantum Computer is still a far-fetched goal but many interesting by-products are clearly appearing outside laboratories.

The main feature of the conference was the very young age of the participating researchers which is a testimony of the liveliness of the field and its bright perspectives for the future.

