

The Time Machine Factory Conference
25-28 October 2015
Turin, Italy



Welcome to

2015

The Time Machine Factory
[unspeakable,speakable] on Time Travel in Turin

25 – 28 October 2015

Palazzo del Rettorato
Università di Torino

PROGRAM

Check updates @

www.timemachinefactory.eu/?q=node/4



Conference Sessions

[I] Causality preservation and Chronology violation, CTCs

[II] Teleportation, entanglement and CTCs

[III] The Mathematical Side of Causality

[IV] Quantum Computing

[V] Faster Than Light

[VI] Space-Time Navigation

Poster Sessions

WINGS Announcement Event

Space-Time Grid

(detailed scheduling in the following)

	October 25 Sunday	October 26 Monday	October 27 Tuesday	October 28 Wednesday
09:00		Session I - A	Session III - A	Session V - A
10:45		Coffee Break	Coffee Break	Coffee Break
11:15		Session I - B	Session III - B	Session V - B
12:55		Lunch Time	Lunch Time	Lunch Time
14:00		Session II - A	Session IV	Session VI - A
16:00		Coffee Break	Coffee Break	Coffee Break
16:15		Session II - B	Session II - C	Session VI - B
17.30	Special Event	Poster Session	Poster Session	WINGS
20:00		Cinema Museum	Social Dinner	

October 25, Sunday, Opening Ceremony

17:30 Popularisation Conference (in italian) at *Nuova Aula Magna Cavallerizza Reale Via Verdi 9 Torino*



October 26, Monday

08:45 Welcome

Session [I-A] Causality preservation and Chronology violation, CTCs

Chair Dr. M. Crosta

09:00 **F. de Felice** *Time Machines: a new frontier of physics*

09:45 **F. Sorge** *Casimir energy in Kerr space-time*

10:15 **D. Bini and A. Geralico** *Turning a charged black-hole into a naked singularity: a perturbative approach*

10:45 COFFE BREAK

Session [I-B] Causality preservation and Chronology violation, CTCs

Chair Dr. Francesco Sorge

11:15 **O. C. Stoica** *Causal structure, spacetime singularities, and a new kind of time machine*

11:35 **R. Slagter** *Tangled up in Spinning Cosmic Strings*

11:55 **V. Athalye** *Spacetime: pre-existing classical label vs. acquired quantum observable*

12:15 **G. De Palma** *Experiments testing macroscopic quantum superpositions must be slow*

12:35 LUNCH



Session [II-A] Teleportation, entanglement and CTCs

Chair Prof. Lev Vaidman

14:15 **A. C. Elitzur** *Title to be announced*

15:00 **L. Maccone** *Signal causality in closed timelike curves*

15:30 **M. Genovese** *Visualising the Page-Wootters scheme of time emerging from quantum entanglement*

16:00 COFFE BREAK

Session [II-B] Teleportation, entanglement and CTCs

Chair Prof. Avshalom C. Elitzur

16:30 **L. Vaidman** *How to build a quantum time translation machine and can we affect the past?*

17:15 **J. Vaccaro** *Making sense of a time symmetric universe: time travelling in both directions*

17:45 **E. Cohen** *CTCs, Retrocausality and Free Will*

20:00 @Cinema National Musum Showing of *Interstellar* (by C. Nolan)



October 27, Tuesday

Session [III-A] The Mathematical Side of Causality

Chair Prof. G. Hörmann

09:15 **J. Vickers** *Causality and solutions of Einstein's equations with closed timelike Curves*

10:15 **M. Kunzinger** *Singularity theorems in low regularity*

10:45 COFFE BREAK

Session [III-B] The Mathematical Side of Causality

Chair Dr. S. Coriasco

11:15 **C. Saemann** *Global hyperbolicity for spacetimes with continuous metrics*

11:35 **S. Garruto** *Cauchy problem in General Relativity*

11:55 **P. Jacquet** *A simple test about potential unitarity violation in the black hole firewall paradox*

12:20 LUNCH



Session [IV] Quantum Computing

Chair Dr. M. Genovese

14:05 **M. Rasetti** *Computability, complexity, machines and physics*

14:50 **E. Prati** *Quantum information at the time-reversal symmetry edge of quantum chaos*

15:20 **G. Castagnoli** *An exact relation between number of oracle queries required to solve an oracle problem quantumly and quantum retrocausality*

15:40 **COFFE BREAK**

Session [II-C] Teleportation, entanglement and CTCs

Chair Prof. J. Vaccaro

16:00 **M. Nowakowski** *Bizarre monogamy of entanglement in time*

16:20 **C. Branciard** *(Quantum?) Processes and Correlations with no definite causal order*

16:40 **S. Lloyd** *Two types of Time Travel: "Harry Potter versus the time machine"*

19:30 **@TBA** *Social Dinner*



October 28, 2015, Wednesday

Session [V-A] Faster Than Light

Chair Prof. L. Fatibene

09:15 **O. Bertolami** *On causality, non-locality, time machines, wormholes & effective theories* (INTRODUCTORY TALK)

09:30 **O. Bertolami** *Phase-Space Non-commutative Quantum Mechanics*

10:15 **F. Lobo** *From the Flamm-Einstein-Rosen bridge and geons to the modern renaissance of traversable wormholes*

10:45 COFFE BREAK

Session [V-B] Faster Than Light

Chair Prof. L. Fatibene

11:15 **P. Salucci** *Dark Matter and Wormholes*

11:45 **R. Garattini** *Traversable Wormholes in Gravity's Rainbow*

12:05 **Z. Osmanov** *Effects of rotation on particle dynamics in wormhole metrics*

12:30 LUNCH



Session [VI] Space-Time Navigation

Chair Dr. M. Gramegna

14:15 **A. Tartaglia** *Using light as a thread for space navigation*

15:00 **U. Kostic** *Setting up an Autonomous Relativistic Positioning System*

15:30 **C. Le Poncin-Lafitte** *The Time Transfer Function as a fundamental tool of space-time navigation: Range, Doppler and astrometric observables*

16:00 **M. Crosta** *Light trajectories and space-time navigation: what can we learn from Gaia?*

16:30 COFFE BREAK

Session WINGs

Chair Prof. A. Tartaglia

17.00 **A. Nobili** *Einstein's general theory of relativity rests on the Equivalence "Principle": how well does it agree with experiments?*

17.25 **M. Crosta** *Light and Gravity, the dawn of Relativistic Astrometry*

17.50 **M. De Laurentis** *Beyond Einstein Gravity*

18.15 **M. Sakelladariou** *Unweaving the fabric of the Universe*

18.45 **S. Capozziello** *Emmy Noether, "The most significant and creative female mathematician of all time" (A. Einstein)*



Poster Session

- 1) Yau Hou *Boson as a Time Machine with Varying Time Rate*
- 2) Culetu Hristu *On the Morris - Thorne wormhole geodesics*
- 3) Koohbor Javad *De Sitter spacetimes and their characteristics*
- 4) Ekaterina Moreva *Emergence of Time from static entangled states*
- 5) Sandra Rankovic *Quantum clocks and their synchronisation*
- 6) Pranav Sharma *Observer and Time*
- 7) Ivano Ruo Berchera *Testing Quantum Gravity by Quantum Light*

Locations

@Cortile del Rettorato, Università degli Studi di Torino, via Po 17, Torino

<http://en.unito.it/media-gallery/detail/1919/1271>

@Museo Nazionale del Cinema – Cinema Massimo, Sala 3, via G. Verdi 18, Torino

<http://www.museocinema.it/index.php?l=en>

@Cavallerizza Reale, Aula Magna, Università degli Studi di Torino, via G. Verdi 9, Torino

<https://goo.gl/maps/XUoYPKTGAX72>