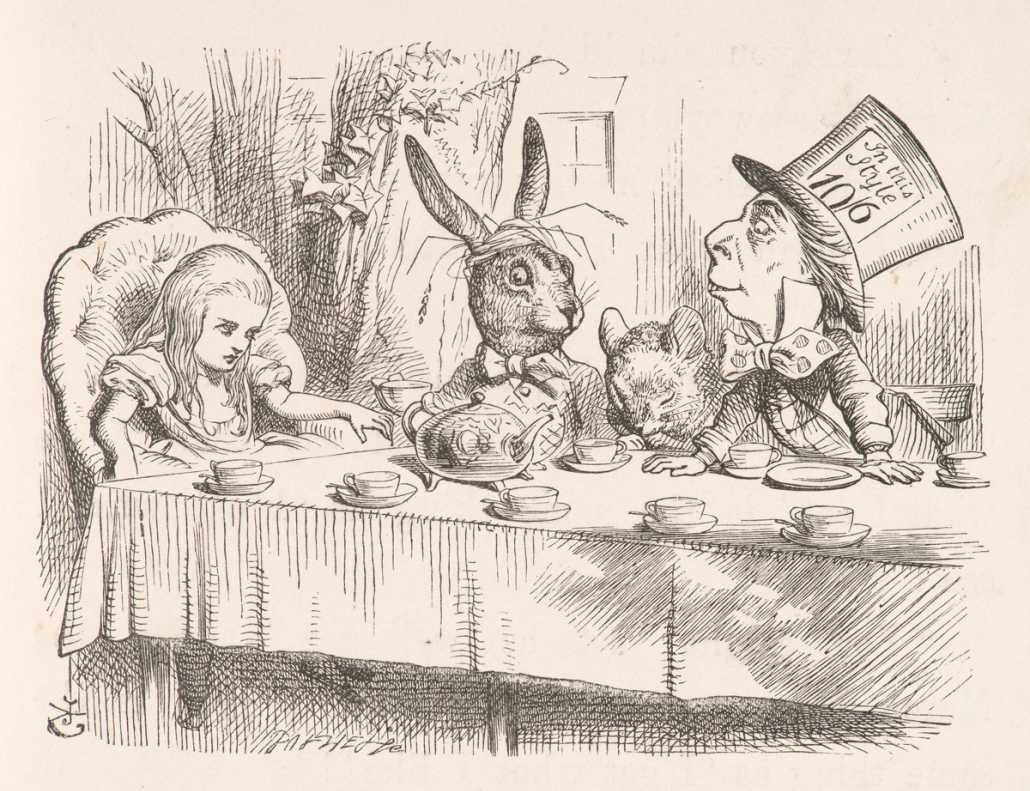
CARROLL WORKSHOP

VIENNA | 15 - 22 FEBRUARY 2022

Vienna invites you to a "Mad Tea Party"!



LOCAL ORGANIZERS

Laura **DONNAY**, Adrien **FIORUCCI**, Romain **RUZZICONI**

TU WIEN

FWF Der Wissenschaftsfonds.

fnrs LA LIBERTÉ DE CHERCHER

UMONS Université de Mons

Welcome to the first international workshop on Carrollian physics!

In 1965, Jean-Marc Lévy-Leblond discovers a new non-relativistic limit of the Poincaré group that contracts light cones on the time axis and any motion in the spacelike directions becomes non-causal. This observation inspires him to give the name of "Carrollian spacetime" to this new type of relativity for which the space interval is invariant, by the pen name of the author of the famous "*Alice's Adventures in Wonderland*", Lewis Carroll. He explains:

Le comportement d'un éventuel Univers qui serait régi par le groupe d'invariance ici n'est pas sans rappeler celui du "Pays des Merveilles". L'absence de causalité est particulièrement claire dans les aventures d'Alice ainsi que la valeur arbitraire des intervalles de temps (cf. en particulier le chapitre 7, "Un thé de fous"). C'est pourquoi il ne nous a pas paru déplacé d'associer le nom de L. Carroll à cette nouvelle limite non-relativiste du groupe de Poincaré.

The behavior of such a Universe, which would be governed by the invariance group discussed here, is somewhat reminiscent of some features of the "Wonderland." Absence of causality as well as arbitrarinesses of time intervals are especially clear in Alice's adventures (cf. in particular the Chapter 7, "A Mad Tea-Party"). Therefore, it did not seem out of place to associate L. Carroll's name to this novel non-relativistic limit of the Poincaré group.

Since this pioneering work, Carrollian physics has been playing a key role in several research directions (fluid/gravity and holographic correspondences, asymptotically flat spacetimes at null infinity, cosmology and geometries of null hypersurfaces such as black hole horizons).

The main purpose of the **CARROLL WORKSHOP** is to gather people who are currently participating to this research endeavor around the world and share our intense interest in Carrollian physics! The edition organized here in Vienna is only the first edition of an exciting event promised to a bright future! Indeed, a second edition is already planned to take place in Mons (Belgium) from the 12th to the 16th of September 2022.

ACKNOWLEDGEMENTS This first edition of the **CARROLL WORKSHOP** is organized by the *Technische Universität Wien* (Austria) and supported by the *Fonds zur Förderung der Wissenschaftlichen Forschung* (FWF, Austria).

List of participants

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Scientific program

TUESDAY 15/02/2022

1. Marc **HENNEAUX** (ULB Brussels & Collège de France)
   Carroll-invariant field theories.
2. Stefan **VANDOREN** (Utrecht U.)
   Carroll symmetry and some applications.
3. Oscar **FUENTEALBA** (ULB Brussels)
   Asymptotic structure of Carrollian limits of Einstein-Yang-Mills theory.
4. Sucheta **MAJUMDAR** (ENS Lyon)
   BMS symmetry in light-cone gravity: A null-front Hamiltonian study.
5. Céline **ZWIKEL** (Perimeter Institute)
   Symmetries at Null Boundaries.

WEDNESDAY 16/02/2022

1. Niels **OBERS** (Nordita & Niels Bohr Institute)
   Carroll Expansion of General Relativity.
2. Yannick **HERFRAY** (UMONS)
   Carrollian geometry of null infinity.
3. Glenn **BARNICH** (ULB Brussels)
   Coadjoint representation of BMS_4.
4. Loïc **MARSOT** (Aix-Marseille U.)
   Planar Carrollian dynamics.
5. Gerben **OLING** (Nordita)
   Carroll Expansion of General Relativity.

THURSDAY 17/02/2022

1. Peter **HORVATHY** (U. Tours & U. Orléans)
   Carroll symmetry and memory effect for plane gravitational waves.
2. Marios **PETROPOULOS** (École Polytechnique)
   Carrollian fluids and chthonian versus celestial holography.
3. Laurent **FREIDEL** (Perimeter Institute)
   Higher spin symmetry for gravity.
4. Jean-Marc **LÉVY-LEBLOND** (U. Nice)
   Carrollian archeological digs.

Scientific program (continued)

FRIDAY 18/02/2022

1. Joaquim **GOMIS** (U. Barcelona)
   Carroll Free Lie algebra. Particle realisations.
2. Piotr **CHRUSCIEL** (U. Vienna)
   Asymptotically locally hyperbolic metrics with negative mass.
3. Andrea **CAMPOLEONI** (UMONS)
   Higher-spin extensions of Carrollian symmetries.
4. Iva **LOVREKOVIC** (TU Vienna)
   Conformal Carrollian Spin-3 Gravity in 3d.
5. Jakob **SALZER** (ULB Brussels)
   Carrollian geometry and superrotation vacua.

MONDAY 21/02/2022

1. Stefan **PROHAZKA** (U. Edinburgh)
   Carrollian and celestial spaces at infinity.
2. Jerzy **LEWANDOWSKI** (Warsaw U.)
   Symmetries of non-expanding horizons and corresponding charges.
3. Alfredo **PÉREZ** (CECs)
   Asymptotic symmetries in Carrollian theories of gravity and Carrollian black holes.
4. Luca **CIAMBELLI** (ULB Brussels)
   Carrollian Limit of Fluid/Gravity.

TUESDAY 22/02/2022

1. Béatrice **BONGA** (Radboud U.)
   Carrollian physics in cosmology.
2. Daniel **GRUMILLER** (TU Vienna)
   Carrollian black holes in 2d.
3. Eric **BERGSHOEFF** (U. Groningen)
   Exotic Limits of General Relativity.

	Tuesday		Wednesday		Thursday		Friday		Monday		Tuesday	
	15 February		16 February		17 February		18 February		21 February		22 February	
09.00-09.30			Chair: R. Ruzziconi	N. Obers	Chair: R. Ruzziconi	P. Horvathy	Chair: L. Donnay	J. Gomis	Chair: L. Donnay	S. Prohazka	Chair: R. Ruzziconi	B. Bonga
09.30-10.00												
10.00-10.30				*Discussion*		*Discussion*		*Discussion*		*Discussion*		*Discussion*
10.30-11.00	Chair: L. Donnay	**Registration**		*Coffee break*		*Coffee break*		*Coffee break*		*Coffee break*		*Coffee break*
11.00-11.30		M. Henneaux		Y. Herfray		M. Petropoulos		P. Chrusciel		J. Lewandowsky		D. Grumiller
11.30-12.00												
12.00-12.30		*Discussion*		*Discussion*		*Discussion*		*Discussion*		*Discussion*		*Discussion*
12.30-14.30		*Lunch **		*Lunch **		*Lunch ***		*Lunch ***		*Lunch **		*Lunch ***
14.30-15.00	Chair: A. Fiorucci	S. Vandoren	Chair: L. Donnay	G. Barnich	Chair: A. Fiorucci	L. Freidel	Chair: R. Ruzziconi	A. Campoleoni	Chair: A. Fiorucci	A. Pérez	Chair: L. Donnay	E. Bergshoeff
15.00-15.30												
15.30-16.00		*Discussion*		*Discussion*		*Discussion*		*Discussion*		*Discussion*		*Discussion*
16.00-16.30		*Coffee break*		*Coffee break*		*Coffee break*		*Coffee break*		*Coffee break*		**Closing address**
16.30-17.00		O. Fuentealba		L. Marsot		J.M. Lévy-Leblond		I. Lovrekovic		L. Ciambelli		
17.00-17.30		S. Majumdar		G. Oling				J. Salzer				
17.30-18.00		C. Zwikel				*Discussion*				*Discussion*		
18.00-22.00						**Social dinner *****						

Venue	**TUtheSky** (BA 11 B07), Getreidemarkt 9, 1060 Wien, BA Gebäude, 11th floor.	
Restaurants	*	**Café Sperl**, Gumpendorfer Straße 11-13, Wien, AT 1060
	**	**Café Museum**, Operngasse 7, Wien, AT 1010
	***	**Café Central**, Herrengasse 14, Wien AT 1010

Organization of the workshop

We thought of the CARROLL WORKSHOP as a **friendly meeting** gathering a moderate number of participants in order to favor active **discussions**, share innovative **ideas** in the field of Carrollian physics and consolidate or create new **collaborations**. We have truly done our best to improve **social and scientific interactions** after several months of remote conferences and workshops.

Each talk will be immediately followed by a **discussion session** involving all the participants. The opportunity has been given to **young researchers** to present their results in the field thanks to a flexible talk format.

VENUE

The talks and related debates will take place in the conference room "**TUtheSky**" (Getreidemarkt 9, 1060 Wien, BA Gebäude, 11th floor) providing a spectacular view on the Austrian capital city!

Additional **seminar rooms** (BA 02A, BA H08, 2nd floor) will be provided for small-group discussions.

TUtheSky

SOCIAL DIMENSION

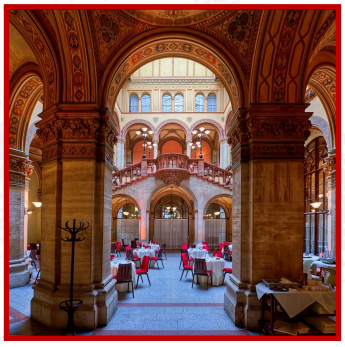
During lunches, we will enjoy together the worldwide renowned ambiance of traditional **Viennese Cafés** (*Café Sperl* & *Café Museum*) which have been at the core of the intellectual activity of the city for decades.

The **conference dinner** will take place on Thursday the 17th of February at the prestigious **Café Central** in the immediate vicinity of the *Hofburg* and the *Graben*.

On Sunday the 20th of February, a visit of the **Austrian Imperial Palace** (*Hofburg*) will be proposed to the participants. This will include the *Sisi-Museum* and the *Kaiserliche Schatzkammer*.

Café Sperl

Café Museum



Café Central (Arkadenhof)

Enjoy your stay in Vienna!

If you have any question, please contact the local organizers:

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The next edition of the CARROLL WORKSHOP will take place at the Université de Mons (Belgium) from the 12th to the 16th of September 2022!

Local organizers:

Andrea **CAMPOLEONI**, Yannick **HERFRAY**

Supported by the *F.R.S.-FNRS, Belgium*.

— Stay tuned for more information! —