### Thinking about Space and Time: 100 Years of Applying and Interpreting General Relativity

#### Tuesday, Sept 12

**Cosmology I**
- 09.00-10.15 Welcome
- 10.15-10.45 Chris Smeenk (London, Ontario)
  - Title tba
- 10.45-11.00 Coffee break
- 11.00-11.45 Cormac O’Raifeartaigh (Waterford)
  - Historical and Philosophical Aspects of the Einstein World
- 11.45-12.30 George Gale (Kansas City)
  - Einstein and Milne: Two Men, Two Opposing Theories, and the Origins of the Robertson-Walker Spacetime Metric

- 12.30-14.00 Lunch break

**History**
- 14.00-14.45 Claus Kiefer (Köln)
  - Space and Time 62 years after the Bern Relativity Conference
- 14.45-15.30 Sjang ten Hagen & Jeroen van Dongen (Amsterdam)
  - Global Historiography and the Belgian Reception of Relativity
- 15.30-16.00 Coffee break
- 16.00-17.15 Marco Giovanelli (Tübingen)
  - "All physics is Metaphysics", On Émile Meyerson’s Influence on Einstein’s late Rationalistic Realism
- 17.15-18.00 Galina Weinstein (Haifa)
  - Two-Body Problem in General Relativity as a Heuristic Guide in Einstein’s Work on the Einstein-Rosen-Bridge (ER) and on the Einstein-Podolsky-Rosen (EPR)

- 19.30 Conference dinner

#### Wednesday, Sept 13

**Space-Time**
- 09.15-10.30 Jim Weatherall (Irvine)
  - Motion of Small Bodies in General Relativity
- 10.30-11.00 Coffee break
- 11.00-11.45 Damian Luty (Poznan)
  - Strategies of Discerning Spacetime Points in Spacetime Structuralism
- 11.45-12.30 James Read (Oxford)
  - Two Miracles of General Relativity

- 12.30-14.00 Lunch break

**Solutions to Einstein’s Field Equations**
- 14.00-15.15 Sabine Hossenfelder (Frankfurt)
  - Black Hole Information - What’s the Problem?
- 15.30-15.45 Coffee break
- 15.45-16.30 Carina Prunkl & Chris Thompson (Oxford)
  - Black Hole Entropy Is Entropy (and not Information)
- 16.30-17.15 Dennis Lehmkühl (Pasadena)
  - The Interpretation of Vacuum Solutions to Einstein’s Field Equations
- 17.30-18.45 Dan Kennefick (Fayetteville)
  - A History of Gravitational Wave Emission

- 20.00 Public evening lecture: John Norton (Pittsburgh)
  - The Error that Showed the Way: Einstein’s Path to his Gravitational Field Equations

#### Thursday, Sept 14

**Cosmology II and Future Developments**
- 09.15-10.30 Ruth Durrer (Geneva)
  - Cosmology: The Problem of Dark Energy
- 10.30-11.00 Coffee break
- 11.00-11.45 Casey D. McCoy (Edinburgh)
  - A Thematic Tour of 20th Century Cosmology: Stability From Einstein and Eddington to Inflation Structuralism
- 11.45-12.30 Niels Linnemann (Geneva) & Manus Visser (Amsterdam)
  - GR, qua vadi? - Indications for an Emergent Nature of Gravity

- 12.30-14.00 Lunch break

**Symmetries**
- 14.00-14.45 Neil Dewar (Munich)
  - Symmetries, the Dynamical Approach to Spacetime, and General Covariance
- 14.45-15.30 Joanna Luc (Cracow)
  - Kretschmann’s Objection and the Problem of the Physical Interpretation of a Theory
- 15.30-16.00 Coffee break
- 16.00-16.45 Ryan Samaroo (Bristol)
  - Friedmann and Some of his Critics on the Foundations of General Relativity
- 16.45-17.30 Samuel Fletcher (Minneapolis, Munich)
  - The Approximate Space-Time Symmetry

- 17.30 -18.00 Wrap-up
- 19.00 Guided tour Einsteinhaus (tbc)
About one hundred years ago, in late 1915, Einstein came up with his gravitational field equations of the General Theory of Relativity. This is often celebrated as one of the most momentous events in the history of science, but at that time, a new theoretical understanding of gravitation had really only begun. No exact solutions to the field equations were known, and the implications of the theory were almost unexplored. It is no surprise, then, that the publication of the field equations gave rise to pioneering research – think of Karl Schwarzschild's black hole solution to the equations, Einstein's discussion about gravitational waves or his first relativistic world model. Since the theory has far-reaching implications for our understanding of space and time, the discovery of the field equations was also followed by intense philosophical discussions to which prominent proponents of positivism and neo-Kantianism, e.g. M. Schlick and E. Cassirer, made contributions of lasting importance. All in all it seems fair to say that, in November 1915, the theory had only just been born; what we now know and value as General Theory of Relativity with all its features only came into being during the investigations and discussions that ensued after the discovery of the field equations.

One hundred years after the first pioneering applications of, and reactions to, Einstein’s momentous discovery, this conference aims at an integrated understanding of how Einstein’s theory of relativity gained momentum. The focus is on the early reception of Einstein’s theory in physics and philosophy and on the systematic questions that emerged shortly after Einstein’s discovery of the field equations. The conference brings together historians of science, philosophers, and physicists.