CQM 2014 talks

Name	Title	Abstract
Miriam Backens	(In)Completeness results for the ZX-calculus	The talk will provide an overview over the completeness and incompleteness results for the ZX-calculus that have been derived over the last few years.
Giulio Chiribella	Categorical purification	The principle of purification is at the core of many structural features of quantum mechanics, as well as many protocols in quantum information. It has tight relations with the program of categorical quantum mechanics, and in particular with the compact closed structure. Still, the principle was originally formulated in terms of the notion of pure state, which relies on an underlying convex set structure. Here I will discuss an approach that eliminates the reference to an underlying convex set, formulating the purification principle and deriving its consequences only in terms of diagrammatic properties within a causal process category.
Brendan Fong	Composing networks via decorated cospan categories	Given a finite set N, we may talk of the graphs that have N as their set of nodes. This gives a lax monoidal functor from (FinSet,+) to (Set,x). Similarly, the diagrams in many string diagram/network-type languages can lead to the definition of an analogous functor. In this talk we discuss a method of producing a dagger compact category from such a monoidal functor, with the intent of capturing the composition of diagrams in these languages.
Amar Hadzihasanovic	String diagrams and the algebra of entanglement	The search for a diagrammatic classification of multipartite entanglement reveals surprising connections to geometric algebra.
Aleks Kissinger & Chris Heunen	This mixed-up world	We will give an overview of representations of mixture and classical data in categorical quantum mechanics, as well as some perspectives, results, and open problems related to the CP* construction
Ray Lal	CQM and axioms for reconstructing quantum theory'	CQM offers a powerful formalism for locating quantum theory in a space of 'reasonable' physical theories; this idea hasn't been fully exploited yet, and I will describe which ideas might be fruitful for future research.
Jason Morton	Other uncertainty models	I'll discuss some other non-quantum, non-probabilistic models of uncertainty and how the CQM perspective can help us understand them.
Pawel Sobocinski	Linear algebra, string-diagrammatically	My only constraint is that I won't be able to make it on Friday morning (I have a lecture from 9:00-11:00), I will try to be in Oxford around lunchtime that day!
Jamie Vicary	Higher quantum theory	I will survey the past, present and future of higher category theory in categorical quantum mechanics.
Alex Wilce	Some nearly quantum theories	After some background on euclidean jordan algebras --- direct sums of finite-dimensional real, complex and quaternionic quantum systems, plus a couple of more exotic alternatives --- I'll discuss some ways in which they can be organized into monoidal categories. This last part is joint work with Howard Barnum and Matthew Graydon.
Will Zeng	Quantum Algorithms in CQM	In this talk, we will present quantum algorithms that have been described in the CQM framework (Deutsch-Jozsa, Grover, Hidden Subgroup, some new ones) and illustrate how to verify and reason about them diagrammatically.
Adverts Session	Samson Abramsky Rui Barbosa Carmen Constantin Shane Mansfield	1. All-versus-Nothing arguments, stabiliser subgroups, and the "AVN triple" conjecture. 2. The Support lattice and the structure of the No-Signalling polytope 3. Logical non-locality for almost all n-partite states

		4. Reality of the Quantum State: A Stronger Psi-ontology Theorem