Further thoughts on pointfree versus classical function rings

Bernhard Banaschewski

This talk will describe a substantially revised version of the proof, presented here last October, that the pointfree function rings $\mathcal{R}L$ are characterized as the ω-updirected unions of sub-l-rings isomorphic to classical $C(X)$s, based on a more imaginative use of the properties of the functors involved.

Relative actions

James Gray

For a relative exact homological category (C, E), we define "relative points" over an arbitrary object in C, and show that they form an exact homological category. In particular, it follows that the full subcategory of nilpotent objects in an exact homological category form an exact homological category. These nilpotent objects are defined with respect to a Birkhoff subcategory in C as defined by T. Everaert in his PhD Thesis. In addition, we introduce relative actions and show that just as in the classical case, there is an equivalence of categories between the category of relative points over an object and the category of relative actions for the same object. This is joint work with T. Janelidze-Gray.

Closure and compactness in frames

David Holgate

Standard topological results relating closure and compactness are well known in frames, but very little analogous work has been done with respect to other compactness properties such as pseudocompactness, countable compactness and almost compactness for instance. Part of the challenge is finding the appropriate definition of closure which pairs with a given type of compactness. We will discuss the interrelation of a variety of closure notions and associated compactness properties in pointfree topology.

This is joint work with Jacques Masuret (Stellenbosch) and Mark Sioen (Brussels).

How nice are the zero-dimensional coreflections for frames and for sigma-frames?

George Janelidze

The talk is devoted to the formulation of the question of the title: there is a hierarchy of properties of reflections, due to Cassidy, Hebert, and Kelly, and it would be interesting to find the right place for the zero-dimensional (co)reflections for frames and for sigma-frames in that hierarchy. The question is suggested by the Galois theory of covering spaces, and it has a very clear answer (so far) only in the case of finite frames.

An introduction to formal closure operators

Zurab Janelidze

In this talk, which is based on joint work in progress with Marino Gran and Mathieu Duckerts-Antoine, we will introduce a notion of a formal closure operator, which unifies several different notions of categorical closure operators studied in the literature. After saying a few words about the general theory, we then look at a new class of examples of formal closure operators which arise from full epireflective subcategories of a given category.

NIP categories?

Gareth Boxall

Category theory has long been involved in model theory. However, much model theory has developed without a great deal of awareness of this fact. It seems appropriate to try to understand some of the current ideas in "point-set" model theory from a category theoretic perspective and indeed people are doing this.

One such idea is the notion of a NIP theory. This is a complete first order theory whose models satisfy a certain condition somewhat combinatorial in nature. There are several equivalent definitions of a NIP theory and one of them lends itself well to a category theoretic viewpoint.

I shall discuss this viewpoint and give some indication of planned future work. This forms part of a project with Charlotte Kestner of the University of Central Lancashire.

Spanning

Guillaume Brümmer

In [1], p. 61, it was claimed that SB = B*S, where S is the symmetriser, a coreflector, turning a quasi-uniform space into a uniform space; B the totally bounded reflector in QUnif, and B* ditto in Unif. Later, in [2], using SB =B*S, a Proposition 1.3 was deduced by Brümmer and Künzi. Still later we noticed that SB does not always equal B*S.

This talk is joint work with Künzi about salvaging Proposition 1.3 and Theorem 1.5 of [2].

[1] G. C. L. Brümmer, On certain factorizations of functors into the category of quasi-uniform spaces. Quaestiones Math. Vol. 2 (1977), 59-84.

[2] — and H.-P. A. Künzi, Bicompletion and Samuel bicompactification. Appl. Categ. Struct. Vol. 10 (2002), 317-330.

The functors $\mathcal{H}$ and possibly Coz for partial frames

Anneliese Schauerte

A partial frame is a meet-semilattice in which certain designated subsets have joins, and finite meets distribute over these joins. We specify which subsets should have joins by means of a selection function, usually denoted $\mathcal{S}$. It turns out that a small collection of axioms of an elementary nature applied to such selection functions allows one to do much traditional pointfree topology, both on the level of frames and that of uniform or nearness frames. These axioms are sufficiently general to include as examples bounded distributive lattices, σ-frames, κ-frames and frames.

Today's topic, involving the functor which takes $\mathcal{S}$-ideals, is particularly strongly connected to ideas stemming from σ-frames. We introduce the notion of an $\mathcal{S}$-Lindelöf element and provide a category equivalence between $\mathcal{S}$-frames and a subcategory of frames.

This is joint work with John Frith.