Jeudi, 3 octobre 2019 à 10h30, Salle de conférence

On concrete dual adjunctions

Marco Abbadini
Dipartimento di Matematica, Università di Milano

Dualities have been proved to be of great interest. One way to obtain a duality is to first establish a dual adjunction between two categories X and A (i.e., an adjunction between X and the opposite of A) and then restrict such dual adjunction to those objects at which the unit is an isomorphism. For example, Stone duality can be obtained as the restriction of a dual adjunction between topological spaces and Boolean algebras. This motivates our interest in dual adjunctions, and the aim of this talk is to discuss how to establish a dual adjunction with as little effort as possible.

To establish a dual adjunction, one should verify some properties–such as functoriality of the functors, naturality of the units and triangular identities– whose proof is often tedious. We outline a general context in which we prove the aforementioned properties once for all; this context encompasses many known dualities, such as Stone, Priestley, Esakia, Jónsson–Tarski, Gelfand for C*-algebras.

In this general setting, we also discuss a condition which is sufficient (but not necessary) to settle the remaining properties; this condition is inspired by a known condition of existence of initial lifts, and applies also to non-natural dual adjunctions.