SEMINAR ON CONTINUITY IN SEMILATTICES (SCS)

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ABSTRACT:

The Fell compactification $\underline{H}(X)$ of a locally quasi-compact T_o-space X can be viewed as a compact ordered space. Then $\underline{H}(X)$ corresponds to a quasi-compact, locally quasi-compact super-sober space ψX whose open sets are all the open upper sets of $\underline{H}(X)$. There is an essential extension $X \hookrightarrow \psi X$ in the category $\underline{T}_o$ of T_o-spaces and continuous maps. We show that

$$\underline{O}(\psi X) \cong DID(L)$$

for the distributive continuous lattice $L=\underline{O}(X)$ - where $\underline{O}(Y)$ is the lattice of open sets of a space Y, D(P) is the dual of a continuous poset P, and I(P) is the continuous lattice underlying the injective hull of P (endowed with the Scott topology σ_P) in the category $\underline{T}_o$.

This result relies upon a representation of ID(L) for a continuous $1,\wedge$-semilattice L, viz.

$$ID(L) \cong Filt_\sigma L,$$

the (continuous) lattice of all those filters of L which are generated by Scott-open subsets of L. For a distributive continuous lattice L, the meet-prime elements of $DFilt_\sigma L$ in their (hull-kernel) topology are (topologically) identified with the pseudo-meet-prime (=weakly meet-prime) elements of L endowed with the Γ-topology of L^{op}.

Furthermore both $\underline{H}(?)$ and $\psi(?)$ are shown to be functorial on the category of locally quasicompact T_o-spaces and continuous perfect mappings.