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Regular rings of functions with Tychonoff domain

Let X denote a Tychonoff space, $C(X)$ denote its ring of real-valued continuous functions, and bX denote X re-topologized by using its zero-sets as a base for the open sets. Then $C(bX)$ is a (von Neumann) regular ring. Let $G(X)$ denote the smallest regular subring of $C(bX)$ that contains $C(X)$. Then X is called an RG-space if $G(X) = C(bX)$.

In this talk we discuss some recent results concerning RG-spaces. Here is a non-exhaustive sampling:

- (a) Countably compact RG-spaces, and “small” pseudocompact RG-spaces, must be compact (and hence scattered and of finite Cantor–Bendixon degree).
- (b) There exist almost compact spaces of Cantor–Bendixon degree 2 that are not compact.
- (c) An RG-space must have a dense subspace of “very weak P -points” (*i.e.*, points not in the closure of any countable discrete set), but there exists a countable space that is not RG but consists entirely of very weak P -points.

This talk summarizes joint research with M. Hrusak and R. Raphael.