Porter, Jack R.; **Woods, R. Grant**
Extensions and absolutes of Hausdorff spaces. (English) ⎡Zbl 0652.54016⎤
New York etc.: Springer-Verlag. XIII, 856 p.; DM 178.00 (1988).

This volume provides a thorough, systematic treatment of extensions and absolutes of Hausdorff topological spaces, their applications to the major problems of point-set topology, and lattice-theoretic background common to their construction.

Extensions of a topological space X are spaces which contain X as a dense subspace. Extensions have been widely studied, especially in important cases (e.g., compactifications of Tychonoff spaces, H-closed extensions of Hausdorff spaces, completions of uniform spaces), and have played an important role in the problem of classifying functions between topological spaces. Another, less well-known, tool which has also been applied in important ways to this same problem is the absolute of a space. First studied in 1958 by Gleason in the context of characterizing the projective objects in the category of compact spaces and continuous functions, the (Iliadis) absolute of a space X consists of an essentially unique zero-dimensional, extremally disconnected space EX and a perfect, irreducible, θ-continuous surjection from EX to X. EX and certain extensions of X can be constructed in such a way that their points are ultrafilters on certain lattices associated with X, and this observation motivates the secondary thrust of the book: "to demonstrate the power of lattice-theoretic concepts when applied to topology."

Following three introductory chapters, chapters 4 through 7 cover the central topics of the book including: general theory extensions, compactifications, H-closed spaces and H-closed extensions, extension properties, realcompact spaces and realcompactifications, and the Iliadis and Banaschewski absolutes. The book concludes two chapters which investigate the interplay between the notions of extensions and absolutes and their interpretation in the setting of abstract category theory.

Lengthy problem sets follow each chapter and provide a useful (if not essential) project for the reader and make the book appropriate as a text for a graduate level course. Historical notes and a very useful bibliography are also included.

Reviewer: S.Carlson

MSC:

54D35	Extensions of spaces (compactifications, supercompactifications, completions, etc.)
54-02	Research exposition (monographs, survey articles) pertaining to general topology
54G05	Extremally disconnected spaces, F-spaces, etc.
54B30	Categorical methods in general topology
54D25	"P-minimal" and "P-closed" spaces
54D60	Realcompactness and realcompactification

Cited in **11** Reviews
Cited in **119** Documents

Keywords:

Iliadis absolute; zero-dimensional, extremally disconnected space; ultrafilters; extensions; compactifications; H-closed spaces; H-closed extensions; realcompact spaces; realcompactifications; Banaschewski absolutes