

Re: Countably infinite Hausdorff topology?

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David C. Ullrich wrote:

>On Tue, 14 Sep 2004 14:04:39 GMT, "shedar" <nobody@nonesuch.com>

>wrote:

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> [...]

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>>would not "cut it". I think one needs

>>to invoke AC (or at least the axiom of countable choice) to get the

>>sequences mentioned above.

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>Seems to me that you may well be right that some sort of AC is

>required for the argument as stated. Seems like a slightly

>silly thing to point out, because people use AC without

>mentioning it this way all the time.

>

>Seems particularly silly in this case because it's trivial

>to convert the argument into one that does not use AC

>(at the expense of converting it into a proof by contradiction):

>Assume the topology is countable and fix an enumeration of

>the open sets. Now each time we need to choose an open

>set with a certain property choose the one with that

>property that comes first in the enumeration.

>

Aren't you using AC to make an infinite number of choices ("each time we need to choose...")?

It's fine by me to use AC. Much of point-set topology as we know it depends on it. And, lately, the Platonist part of me has come to "believe in" AC.

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