

Re: Space Exploitation

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"Terry Goodrich" <terry@csmgdesign.com> wrote in message news:<Vdavic.1959\$2M1.738@bignews3.bellsouth.net>...
> > *At current prices, it would probably have to be something that can*
> > **only* be made in space (and that people will pay a lot of money for,*
> > *like a cure for cancer).*
>
> *I agree, but what has there been that could only be made in space?*

One type of material, that is expected to have interestingly useful properties, that may only be able to be manufactured into product form in microgravity, is ZBLAN glass (e.g., see http://science.nasa.gov/newhome/headlines/msad05feb98_1.htm). When used to make optical fibers, this is anticipated to result in fibers with very low loss per unit length. (Most optical fibers absorb half of the light put into them, in distances on the order of a km (>1 dB/km attenuation). ZBLAN glass has an anticipated attenuation of as low as 0.002 dB/km (per <http://optics.nasa.gov/current.html>))

What's this good for? In the optical fiber based communications industry, this could allow for a much smaller number of repeaters (a very significant factor for undersea cables). (Of course, the market for optical fiber for comms is pretty soft just now, after the bubble burst a couple of years ago; however, demand will likely eventually pick up again.) Myself, I was looking at this for the purpose of transmitting power via laser light over optical fiber, in which case reducing attenuation is probably necessary to making this viable for most applications.

Looks like ZBLAN formed under gravitational stress doesn't have the nice low-loss property. "Processing ZBLAN in microgravity suppresses crystallization and improves the transmission." Sounding rocket and KC-135 experiments have been done by researchers from MSFC, with promising results. Shuttle flights were planned; I'm not sure if they've happened yet. I can't find any news about this since 2000; has anyone else heard what's happening with this?

If the production technology works out, and a market for this can be

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developed, this could motivate an orbital factory for pulling ZBLAB fibers from boules sent up from Earth (or heat-treating spools of ZBLAN fiber that are sent up from Earth, to remove crystalline defects.)

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