

biophotonic bandgap crystals

first photonic BGC:

### *Photon Bandgap Crystals*

Photonic crystals are materials patterned with a periodicity in dielectric constant, which can create a range of 'forbidden' frequencies called a photonic bandgap. Photons with energies lying in the bandgap cannot propagate through the medium. This provides the opportunity to shape and mould the flow of light for photonic information technology.

<http://www.nature.com/nature/journal/v386/n6621/abs/386143a0.html>

**Photonic crystals** are periodic [optical nanostructures](#) that are designed to affect the motion of [photons](#) in a similar way that periodicity of a [semiconductor crystal](#) affects the motion of [electrons](#). Photonic crystals occur in nature and in various forms have been studied scientifically for the last 100 years

[http://en.wikipedia.org/wiki/Photonic\\_crystal](http://en.wikipedia.org/wiki/Photonic_crystal)

tutorial on photonic crystals

<http://ab-initio.mit.edu/photons/tutorial/>

Photon Bandgap Crystals

<http://www.wired.com/wired/archive/8.09/optical.html>

bio Photon Bandgap Crystals

SHG activity from potato starch granule is so strong it is visible to the naked eye, even under ambient room light. The potato specimen is acting as an array of nonlinear biophotonic bandgap crystals.

## Handbook of biological confocal microscopy

[http://books.google.com/books?id=IKcPnaNPrhoC&pg=PA711&lpg=PA711&dq=biophotonic+bandgap+crystals&source=bl&ots=r8RrJs\\_fws&sig=Ga2svTLojBXJj4nK9XhZVbgkoXI&hl=en&ei=TyDNTPeHM4vSsAP1sJn7Dg&sa=X&oi=book\\_result&ct=result&resnum=3&ved=0CBMQ6AEwAg#v=onepage&q=biophotonic%20bandgap%20crystals&f=false](http://books.google.com/books?id=IKcPnaNPrhoC&pg=PA711&lpg=PA711&dq=biophotonic+bandgap+crystals&source=bl&ots=r8RrJs_fws&sig=Ga2svTLojBXJj4nK9XhZVbgkoXI&hl=en&ei=TyDNTPeHM4vSsAP1sJn7Dg&sa=X&oi=book_result&ct=result&resnum=3&ved=0CBMQ6AEwAg#v=onepage&q=biophotonic%20bandgap%20crystals&f=false)

Nonlinear bio-photonic crystal effects revealed with multimodal nonlinear microscopy

Summary:

Highly optically active nonlinear bio-photonic crystalline and semicrystalline structures in living cells were studied by a novel multimodal nonlinear microscopy. Numerous biological structures, including stacked membranes and aligned protein structures are highly organized on a nanoscale and have been found to exhibit strong optical activities through second-harmonic generation (SHG) interactions, behaving similarly to man-made nonlinear photonic crystals.

<http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2818.2002.01081.x/abstract>

<http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2818.2002.01081.x/full>