Nitrogen defect in carbon nanotubes

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Tubes are fun!

- Rich chemistry (carbon network)

- Single molecule *mechanical* and *electronic* properties

- Potential applications: nanotech, materials, electronics etc.
Why only “potential”?  

So far, very few devices

- Fabrication issues: *spaghetti* of metallic and insulating tubes
- Modifications, tuning
Nitrogen impurity

Motivation:

- Chemically active site
- Changing electronic behaviour
Density of states

Pure tube

DOS, arb. u.

E, eV

N concentration
Does it really exist?

N-CNT (Brighton)  Nanotube crystal from C$_{60}$/C$_{59}$N (Cambridge)

We are going to find out!