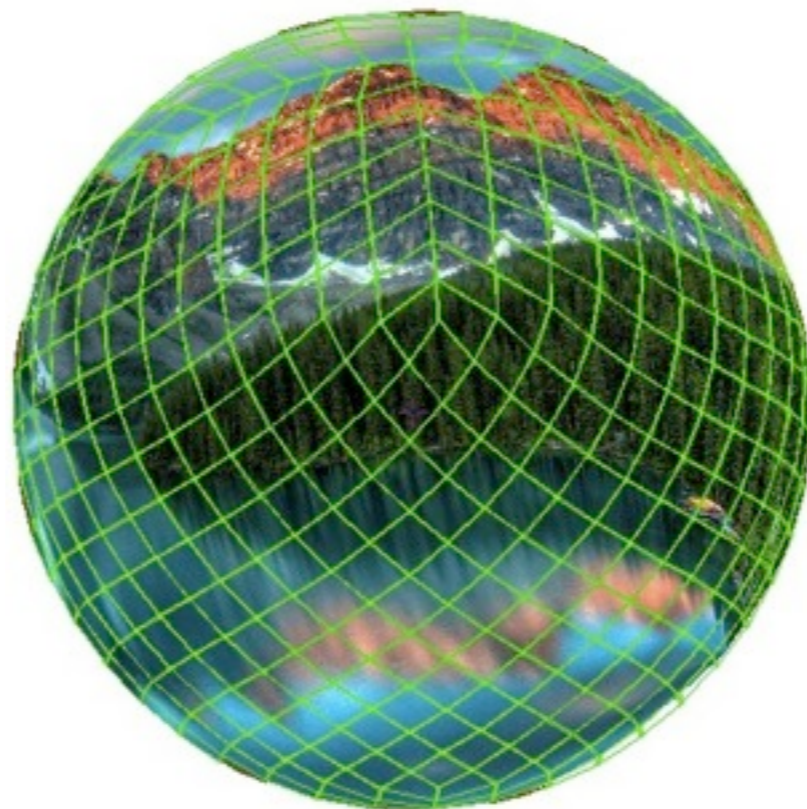


Interactive data exploration through on-the-fly generation of HiPS tiles

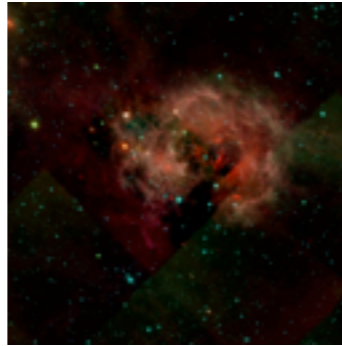
Thomas Boch, François-Xavier Pineau



A few words on HiPS

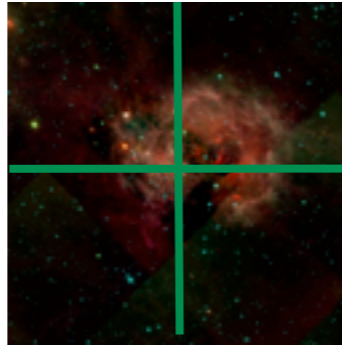
- HiPS: **H**ierarchical **P**rogressive **S**urveys
- Hierarchical tiling mechanism to browse seamlessly image, catalogue and cube data
 - HEALpix-based tessellation
- HiPS clients: Aladin desktop, Aladin Lite, Mizar
- *hipsgen*: tool to generate HiPS from a set of images/cubes/catalogue
Tiles **generated once** and served **statically**
- More info, documentation & tools on <http://aladin.u-strasbg.fr/hips/>

HiPS pyramid



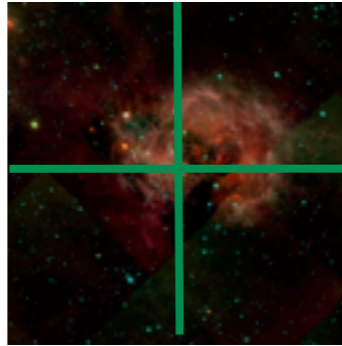
Level 4

HiPS pyramid



Level 4

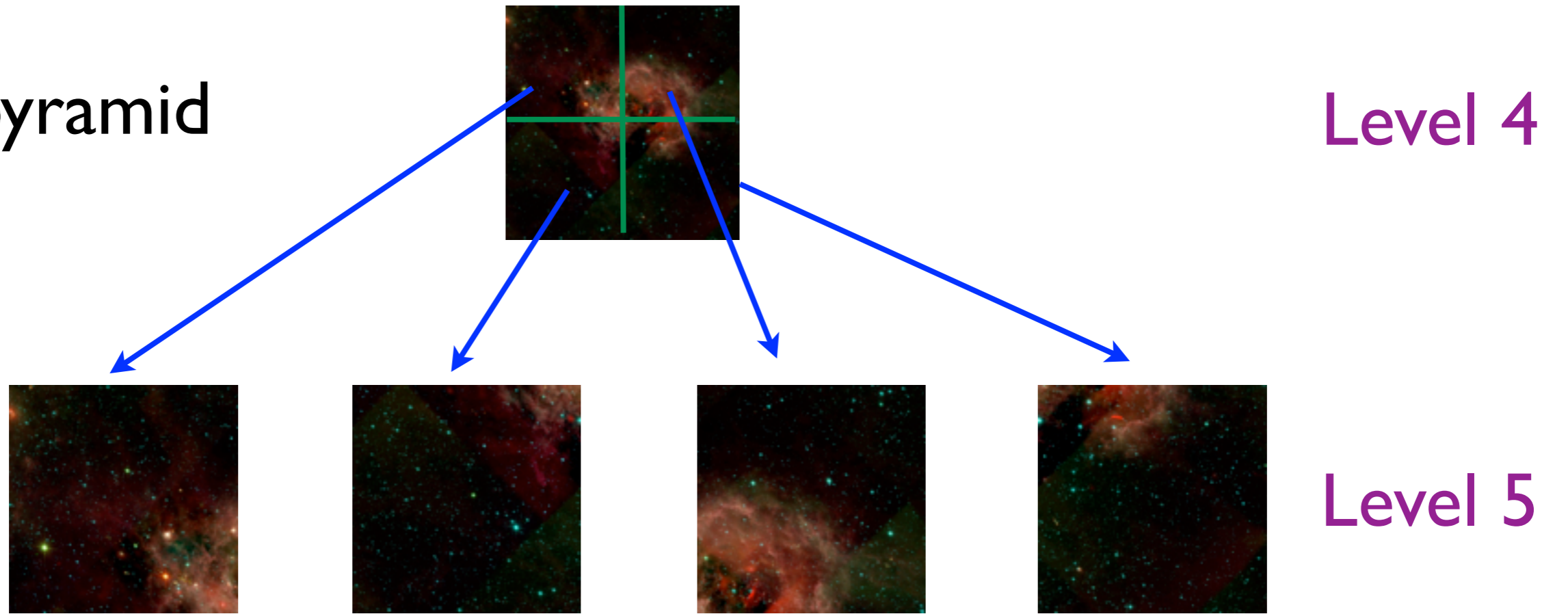
HiPS pyramid



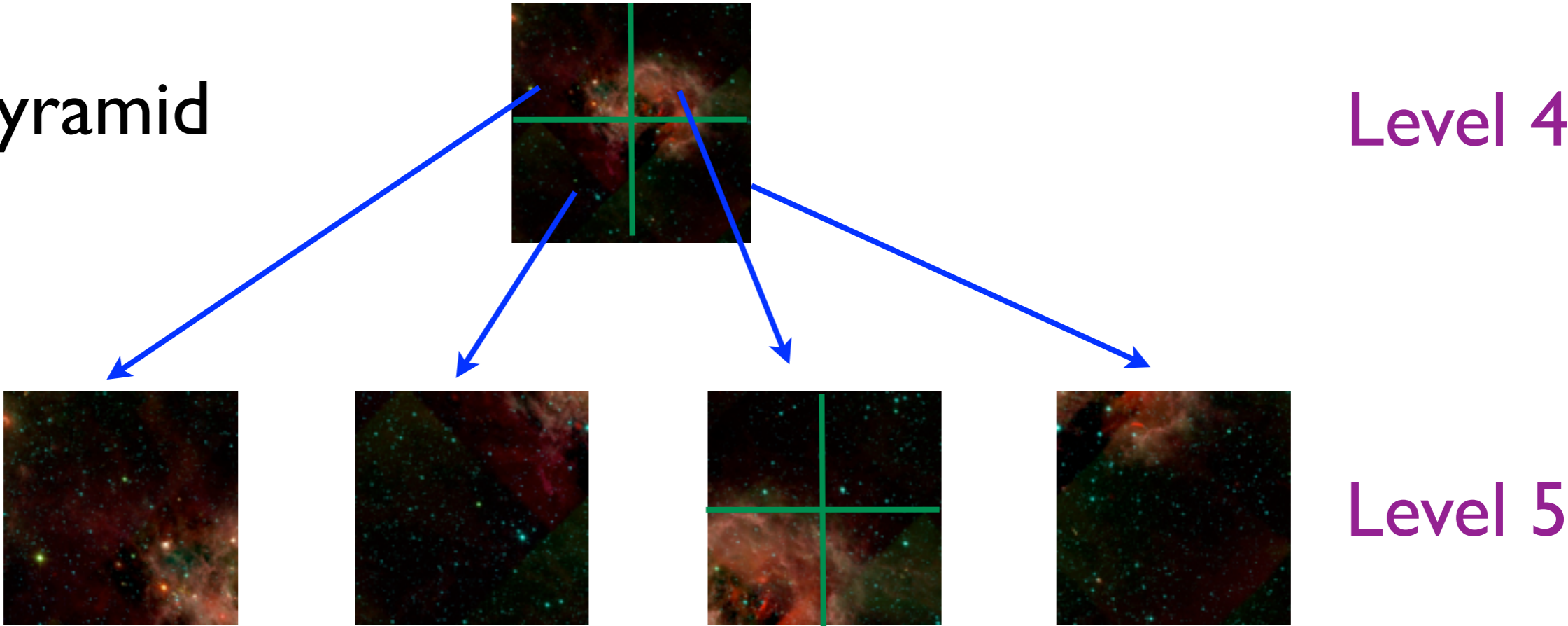
Level 4

Level 5

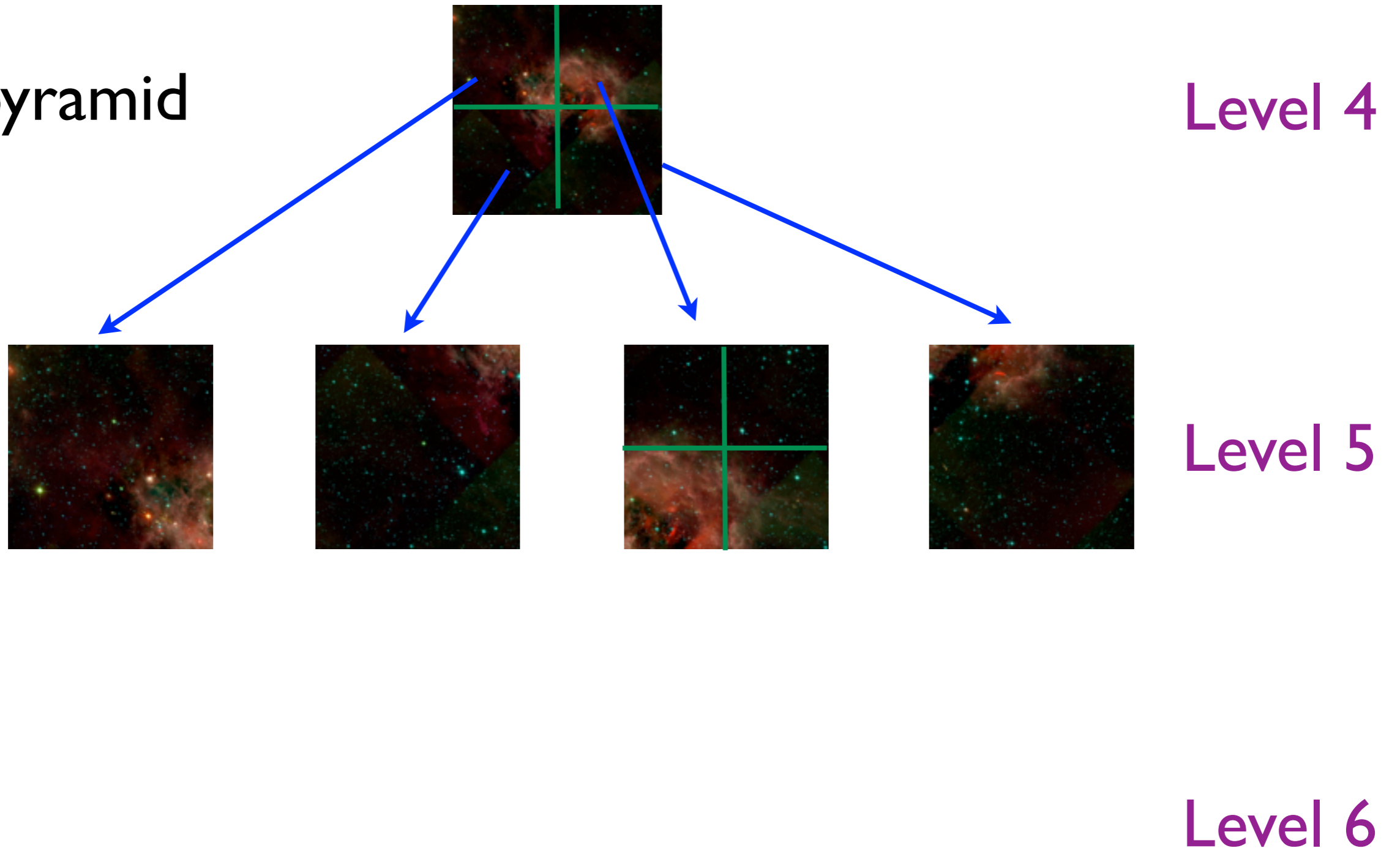
HiPS pyramid



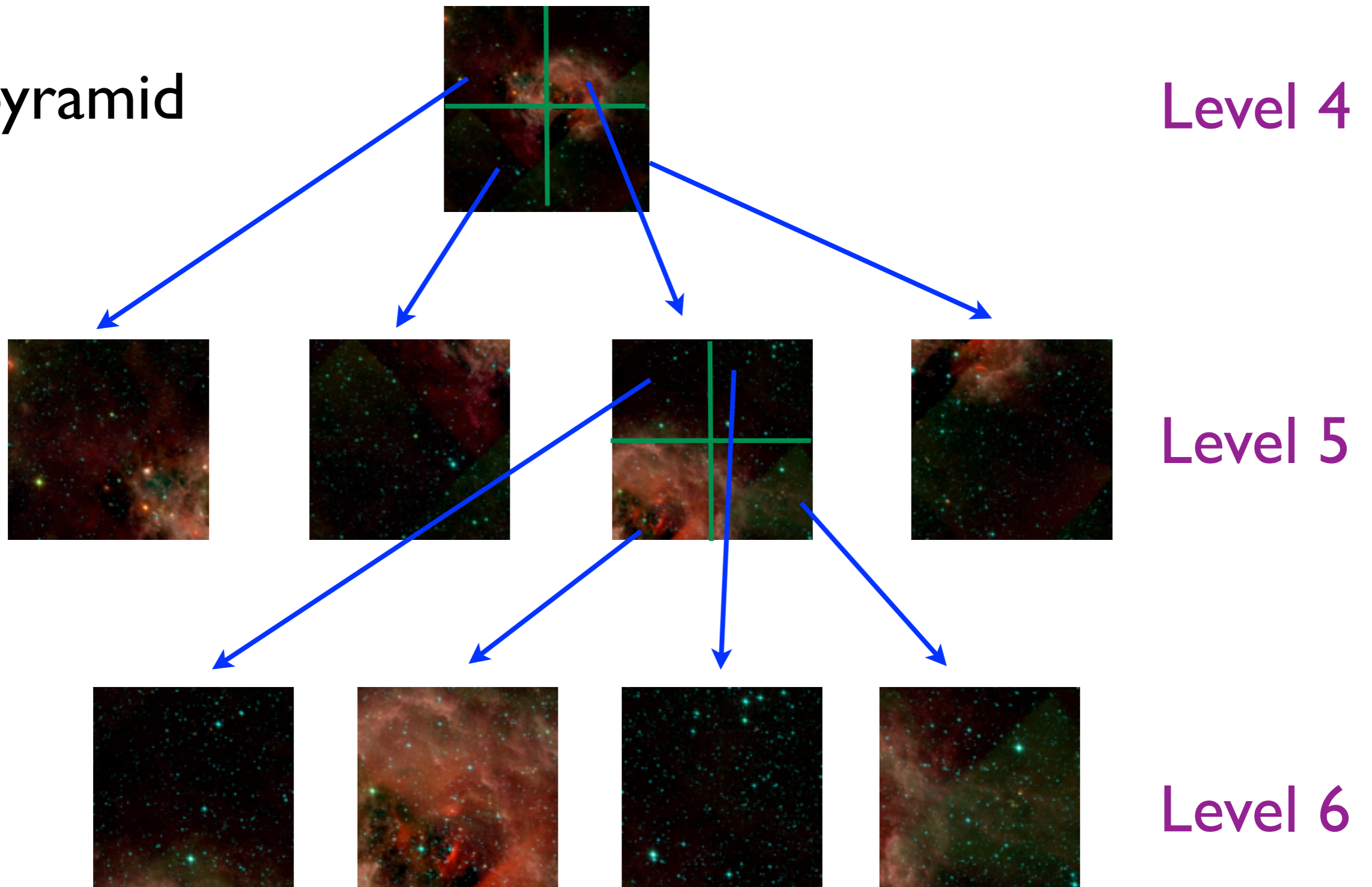
HiPS pyramid



HiPS pyramid



HiPS pyramid



Nanocubes

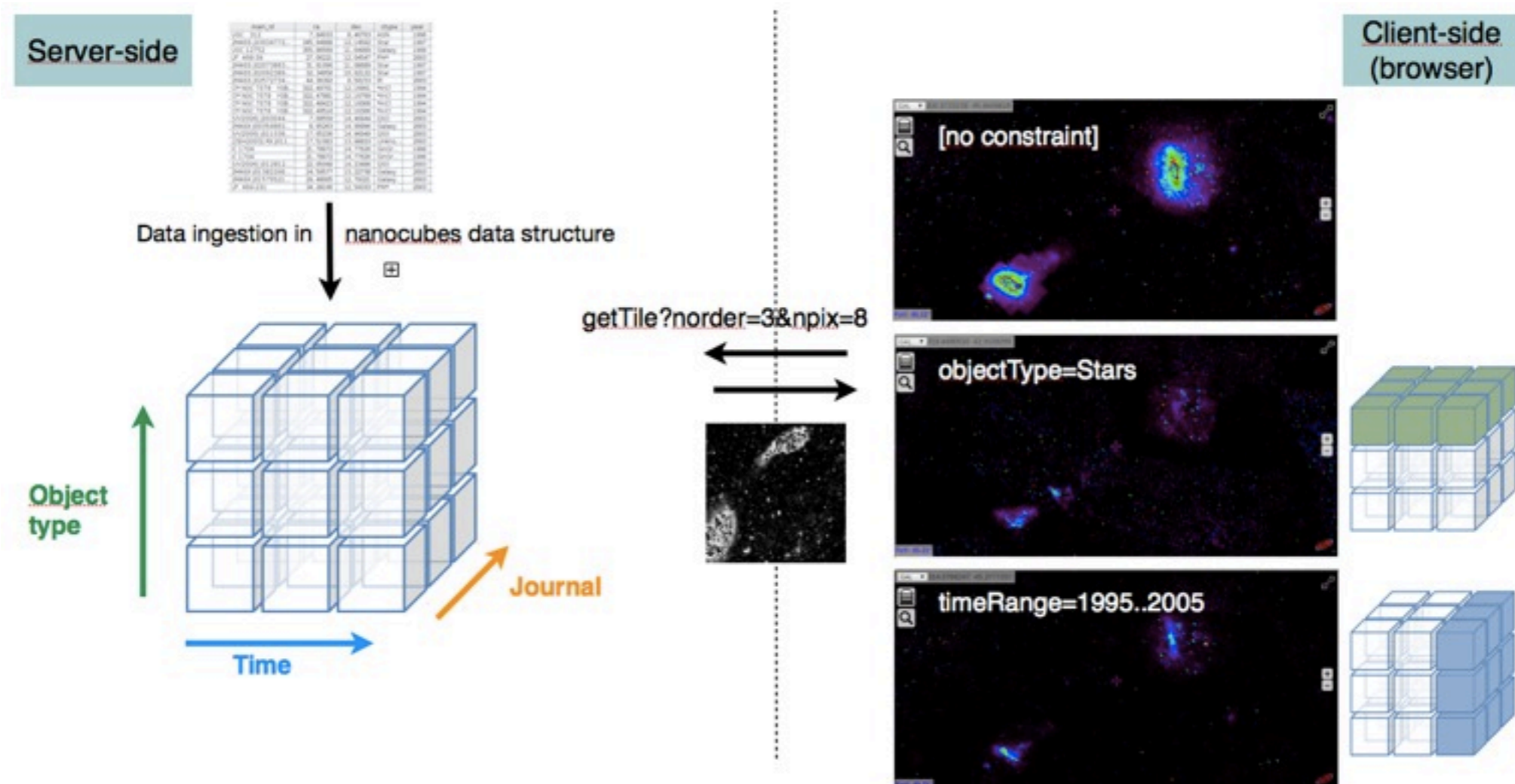
- *A&T Labs - Research* paper (IEEE Infovis 2013)
 - <http://nanocubes.net/>
 - "*Real-Time Exploration of Spatiotemporal Datasets*"
 - Data with position, time and a few categorical attributes
- C++ code available
 - <https://github.com/lauirolins/nanocube>
- Provides fast generation of
 - Id-histograms
 - count maps (tiles with spherical Mercator projection)



Thomas Boch, dynamic generation of HiPS tiles - IVOA Interop, Banff, Oct 2014

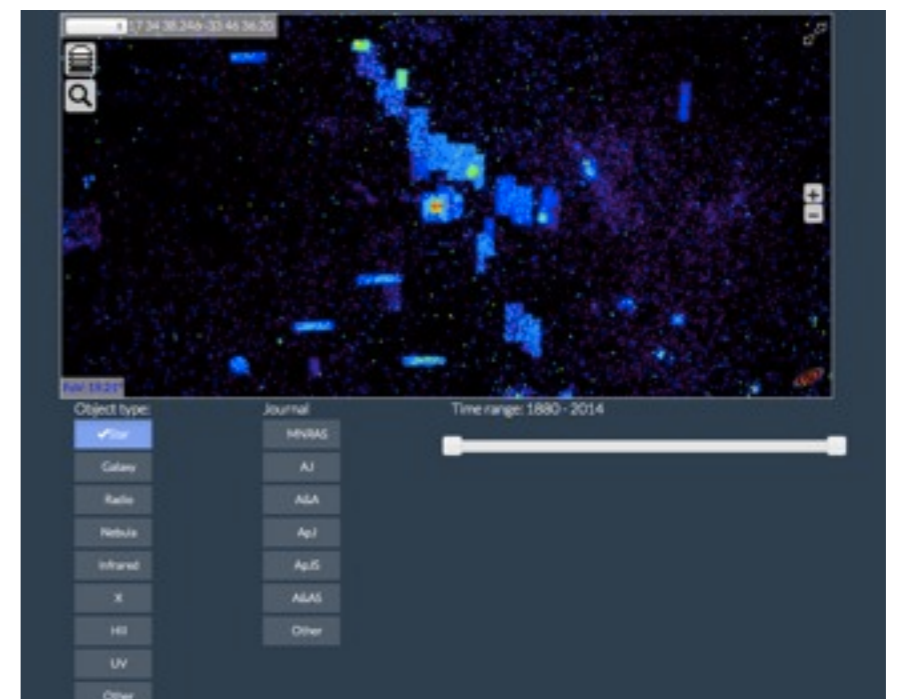
JNanocubes

- CDS implementation of nanocubes data structure
 - written in Java
 - outputs HiPS tiles



Demo

- Tested on SIMBAD data:
10M entries with **object position**, **2 categories** (otype, journal) and a **date** (publication year)
- Aladin Lite consumes HiPS tiles generated on-the-fly by JNanocubes server
- <http://tinyurl.com/adass2014>



Key figures

- Nanocubes tree generation: 100 s
- Tile generation: 5-20 ms for a 128x128 tile
(16k requests in nanocube tree)
- Memory greedy: 4 GB

How is that VO-related ?

- Help user explore/drill-down available data
- Similar idea as Tom Donaldson's [Guiding Queries with Data Summaries](#) (Hawaii Interop 2013)

Perspectives

- Find a smarter way to organize/serialize nanocube data structure
- Add 1-D histograms for categories and time dimension
- Test it with 100M+ table rows
- Distribute tool to generate JNanocubes