Why Python?
- High-level, interactive, easy-to-use, versatile, freely available
- Easy computation-efficient extension with cython/c
- Well suited to design relatively complex neuroimaging objects
- Presence of well-developed and tested scientific libraries:
  - numpy (numeric python): array functions
  - scipy (scientific python): various utilities
  - matplotlib & mayavi: visualization

Documentation
- PDF, HTML included in distribution
- Interactive Session help and examples
- Web-based: http://neuroimaging.scipy.org

Access to Other Scientific Tools
- pymvpa : multivariate analysis tools in python
- mlpy: machine learning toolbox
- pygifti: python binding of gifti library
- pyNN and many other Neural Network packages
- sympy: symbolic mathmatics
- brainvisa: interface to many anatomical/diffusion and visualization functions

What in Nipy Now?:
- GLM Model (Model specification/fit)
- Parametric tests: (false discovery rate, Gaussian Random theory)
- Non-parametric Tests: (voxel-level, cluster-level, mixed effects)
- Spatial Models:
  - region-of-interest based analysis
  - anatomical-functional parcellations
  - structural models (brain functional landmarks)

Visualize Statistical Results

Scientific Python is a high level platform to support long-term sustainable development in neuroimaging

Automated Test Framework
Ensures robust and reproducible software
Bugs found early in development cycle
Tests documentation and code

Ever-Growing Collaboration Effort
Size represents number of contributors

Resting State ICA
(2D/3D Visualization)
G.Varoquaux
(Poster 536 F-PM)

Visualizing changes in coherence of resting state functional connectivity networks after 10 minutes of repetitive TMS (1 Hz). Thanks to E. Nomura, C. Gratton and M. D'Esposito (Poster 282 M-PM)

Whats Currently Being Developed
- spatial normalization
- handling regressors/contrasts in symbolic python formalism
- connectivity models: inference of brain connectivity/ ICA
- Data Quality checking Methods
- Timeseries/Coherence Models
- Probablistic Spatial Models
- Haemodynamic Response Estimation
- Interfaces to other existing packages for cross validation
- Pipeline architecture/ parallelization