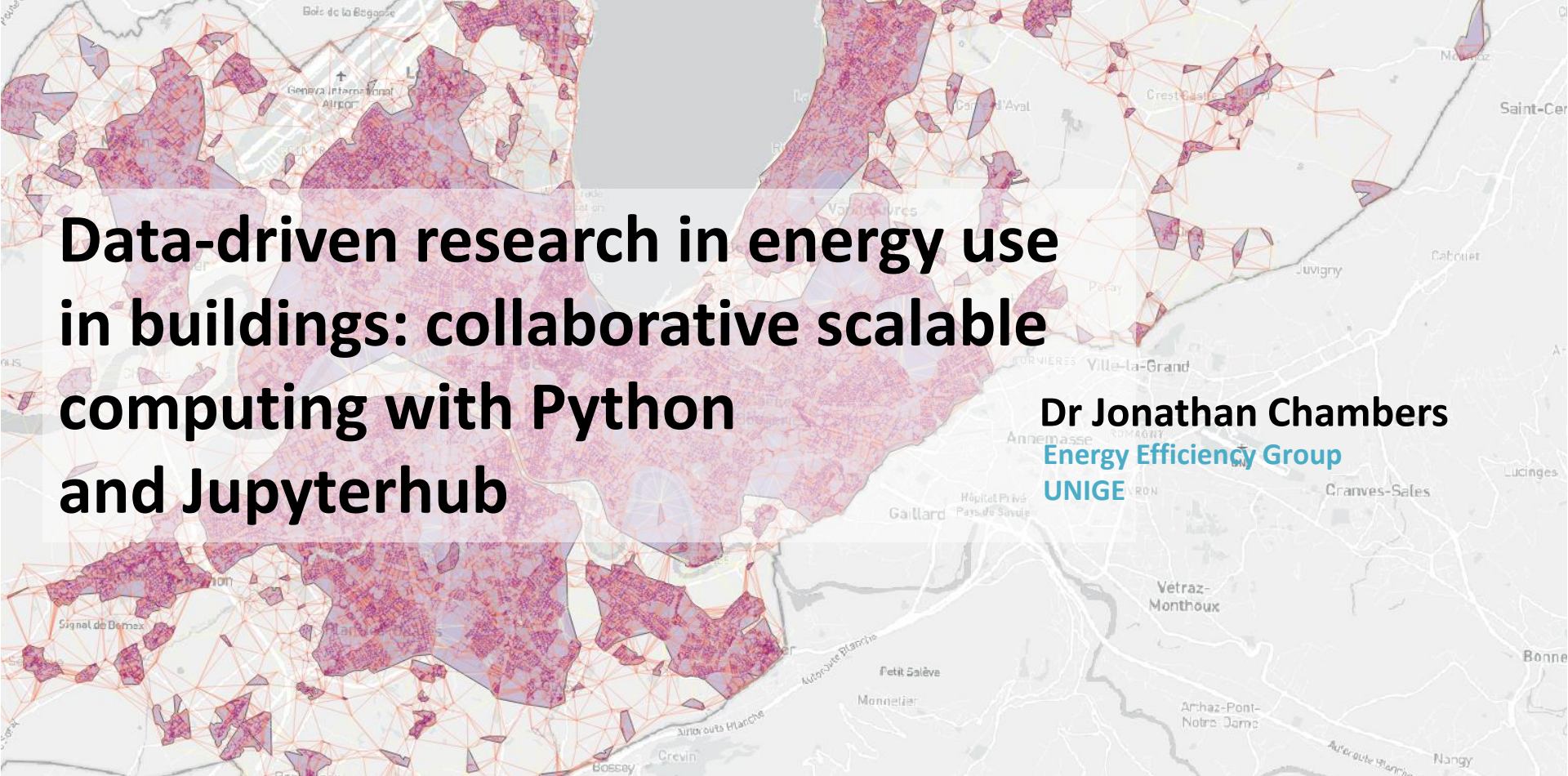




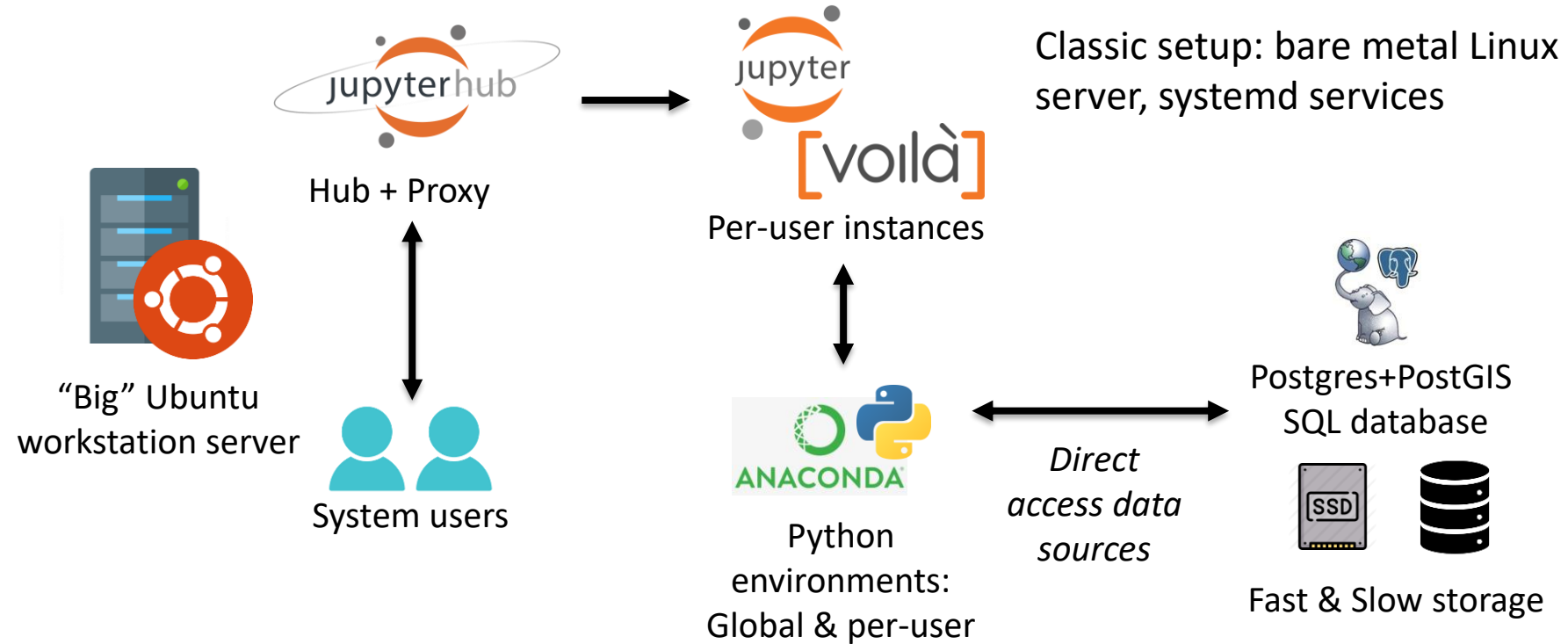
Data-driven research in energy use in buildings: collaborative scalable computing with Python and Jupyterhub

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Background

- Researching energy in the built environment
 - Decarbonisation of heating and cooling
- Increasingly data-intensive using GIS data sources, whole building stock models
 - E.g. Swisstopo provides datasets of all buildings with geometry data
- Models and data are not "clean"
 - Irregular and problematic data sources
 - Models need to make different approximations and assumptions depending on data, research goals
- Big advantages to **interactive** computing
 - Load, model, run, visualise -> without waiting for batch systems
 - Use **Jupyter Notebooks**
- Big advantages to sharing data sources, computing resources

Solution: shared Jupyter hub system

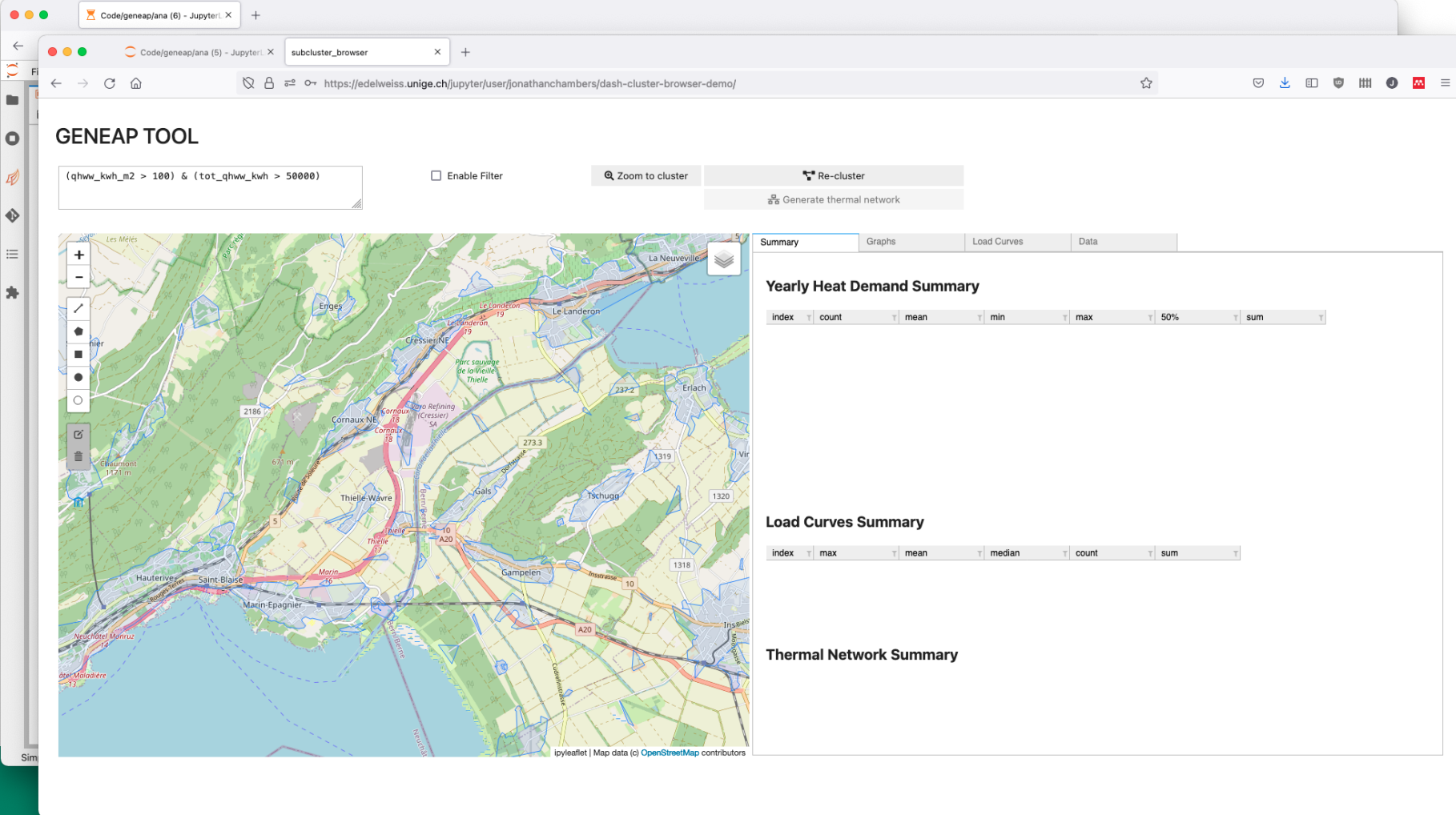


Flexible use cases

- Access to high performance interactive computing *from anywhere*
 - 160days continuous uptime during first confinement!
- Facilitate collaboration projects
 - Shared directories
 - Shared database tables = SQL joins across different datasets
- Teaching
 - Pre-prepared python environments and notebooks for courses
 - Avoid problems for students installing on personal laptops, easy to administer
- Sharing results interactively
 - ‘Voila’ is an extension to create interactive pages from Jupyter notebooks
- Many useful tools and extensions in the Jupyter ‘ecosystem’

Example

- Geospatial Analysis and Planning (GENEAP) project
- Prototyping interface for district thermal network modelling algorithms



Thank you for your attention!



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