

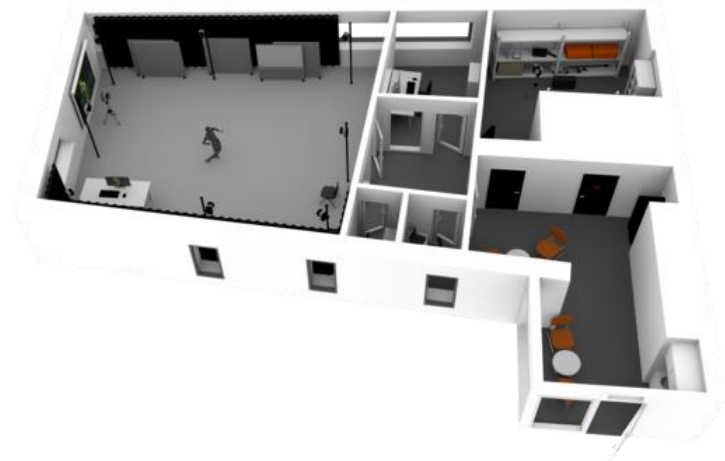
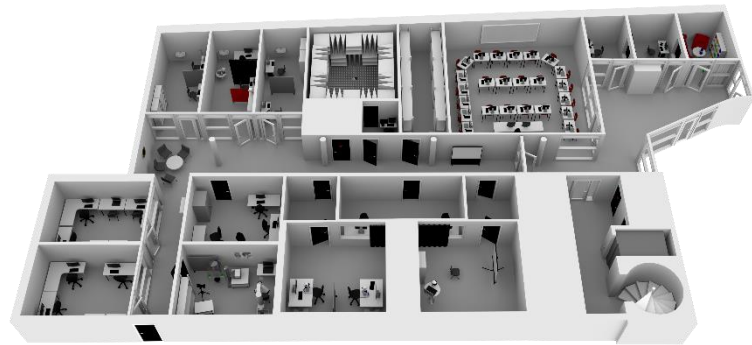
Visualisation using VR

Lund University Humanities Lab

Lund University Humanities Lab

A Research Infrastructure

- Facilities
- Staff 20+
- Users 500+



Lund University Humanities Lab

A Research Infrastructure

- Facilities
 - Articulography
 - Bio Pac
 - EEG
 - MRI
 - Eye-tracking
 - Motion Capture
 - 3D Scanning
 - **Virtual Reality**
 - LARM-studio

- Project Server
- Corpus Server
- Build Server

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- Workflows

- Accessibility
- Transparency
- Sustainability

- Teaching and Training

- Courses (PhD level) **6**
- Group Tutorials **12**
- Workshops
- Consultations **168**
- Starter's Kit
- Guidelines
- Demos **48**
- Website

*2019

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UX

DIY

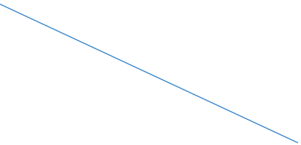
*2019

Lund University Humanities Lab

Supported VR workflows

- 3D scanning, imagebased 3D-modelling and 3D GIS
- 3D motion capture for VR

- 3D eye-tracking
- 3D language learning
- VR framework for visualisation of big datasets



LU Archeology
+
LU Humanities Lab
=
TRUE

Lund University Humanities Lab

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Animation: **Carolina Larsson**, LU Humanities Lab

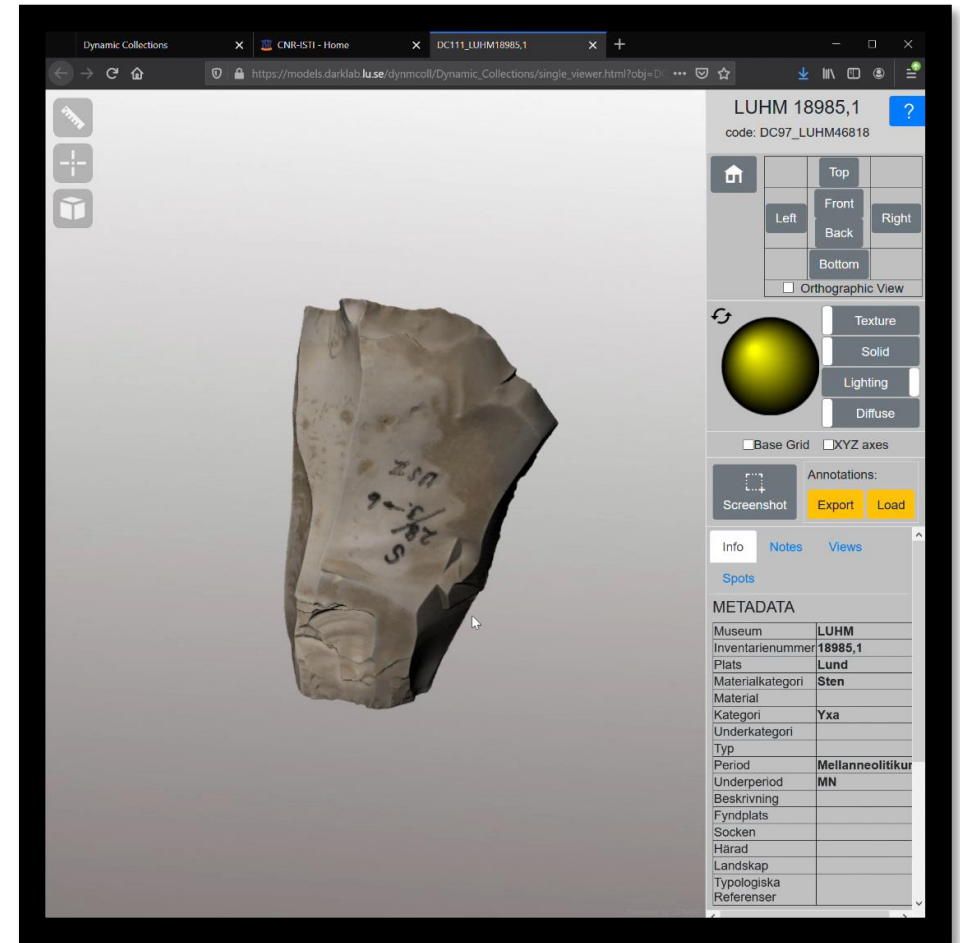
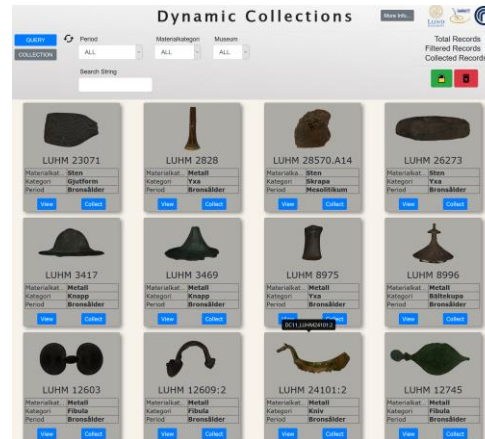
Lund University Digital Archaeology Laboratory DARK Lab Dynamic Collections project

3D database

- 3D-scanning
- Imagebased 3D-modelling

3DHUB

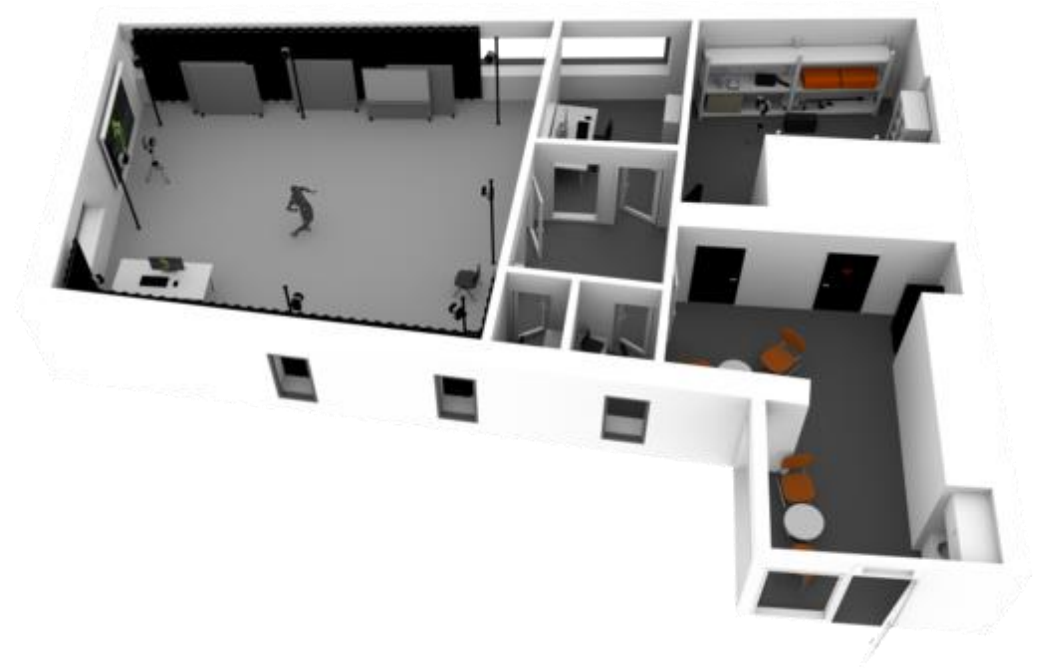
- open source
- free to use



Nicolò Dell'Unto (PI), LU Archaeology and Ancient History

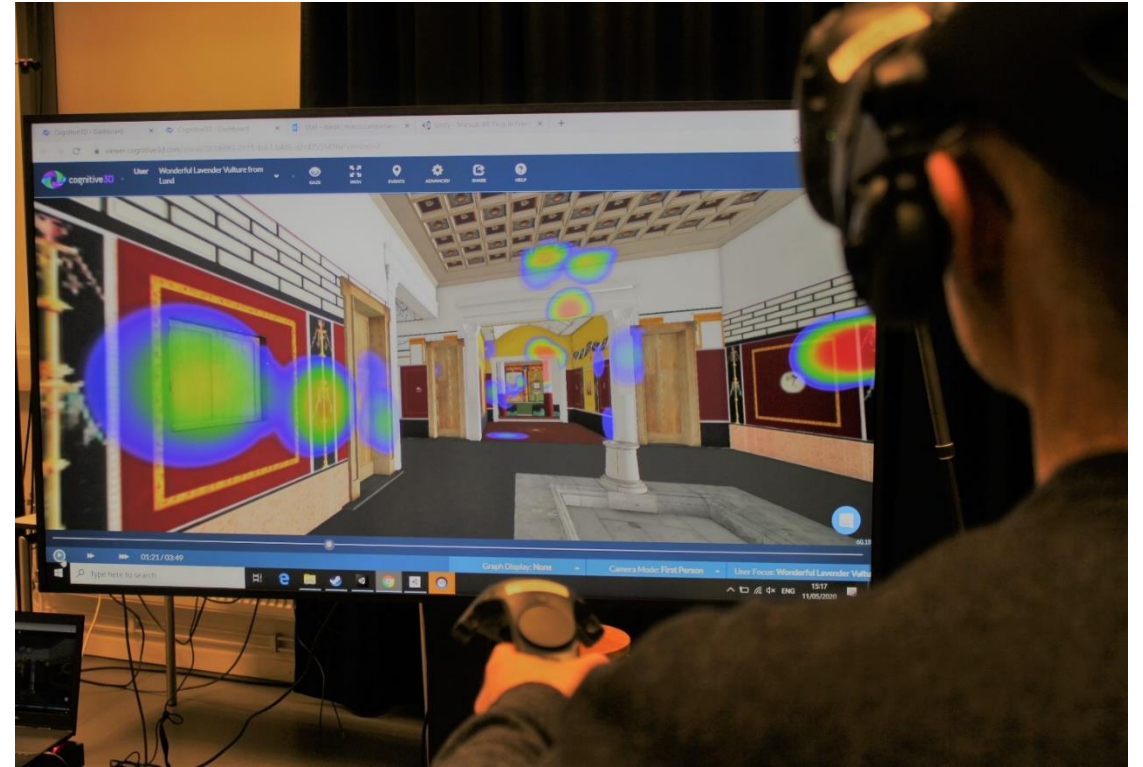
Lund University Humanities Lab

The VR facility



- **Varjo VR-2 Pro** with eye resolution (center), hand- and eye-tracking (high end)
- **HTC Vive Pro**

Case study on visibility in the Roman house (Pompeii)



Danilo Marco Campanaro, LU Archaeology and Ancient History

Giacomo Landeschi, LU Archaeology and Ancient History + LU Humanities Lab

Language learning and brain plasticity

A study of rapid plasticity and short-term second language learning with the help of VR)



Lara Langensee (PhD candidate), LU Logopedics, Phoniatics and Audiology

Johan Mårtensson (PI), IKVL/Medfak & LU Humanities Lab

Courtesy of **Alexander Klippel & Jiayan Zhao**, Penn State University

A Virtual Reality framework for interactive exploration of complex 3D data

Stefan Lindgren (PI), LU Humanities Lab

Oscar Agertz, LU Astronomy and Theoretical Physics

Henrik Garde, LU Humanities Lab

Mattias Wallergård: LU Design Sciences

Simon Holk: LU Design Sciences

Melvyn B Davies, LU Astronomy and Theoretical Physics

Diederick C Niehorster, LU Humanities Lab

Marcus Nyström, LU Humanities Lab

Courtesy of **Soneji Lab** for sharing:

Shamit Soneji

Stefan Lang

Oscar Legeth

Johan Rodhe

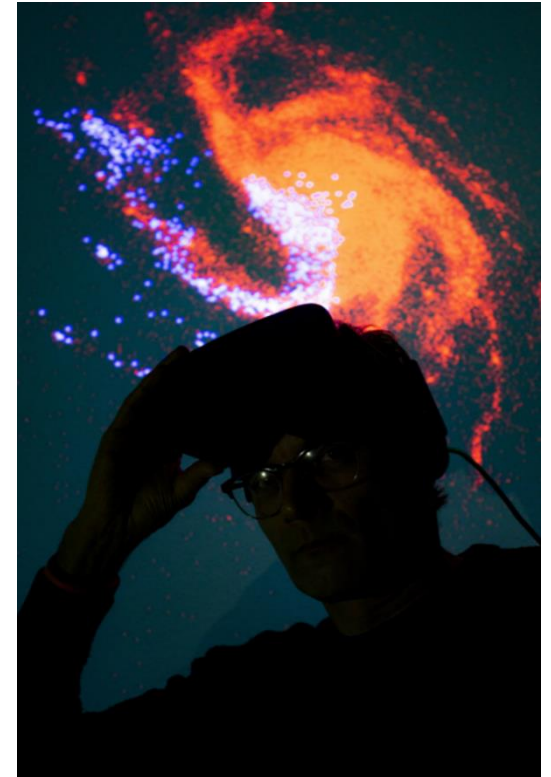
Courtesy of the **VR Lab teachers** for the VR course:

Joakim Eriksson

Günter Alce

Mattias Wallergård

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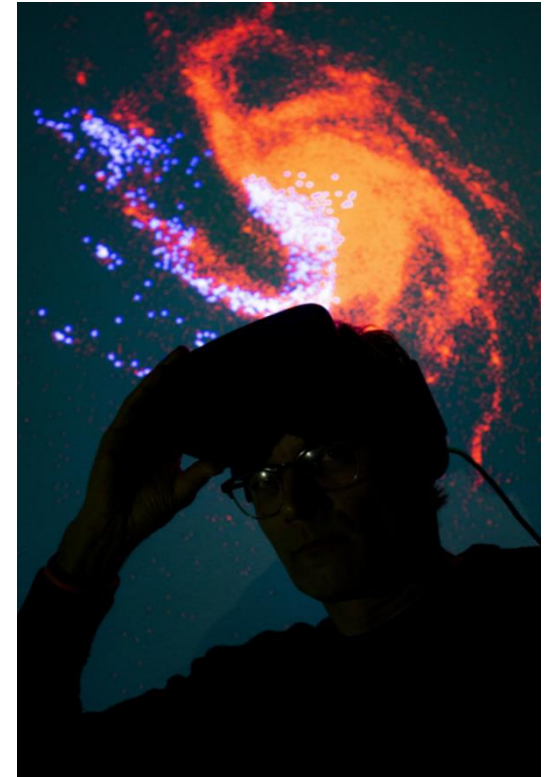
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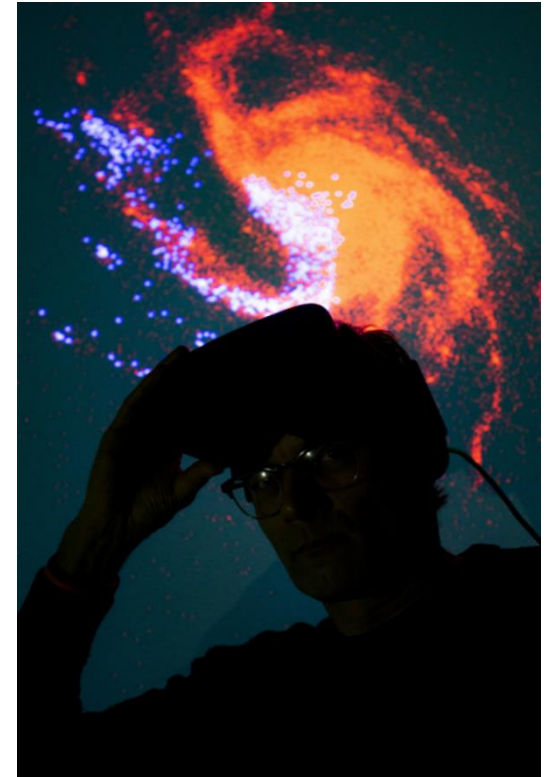
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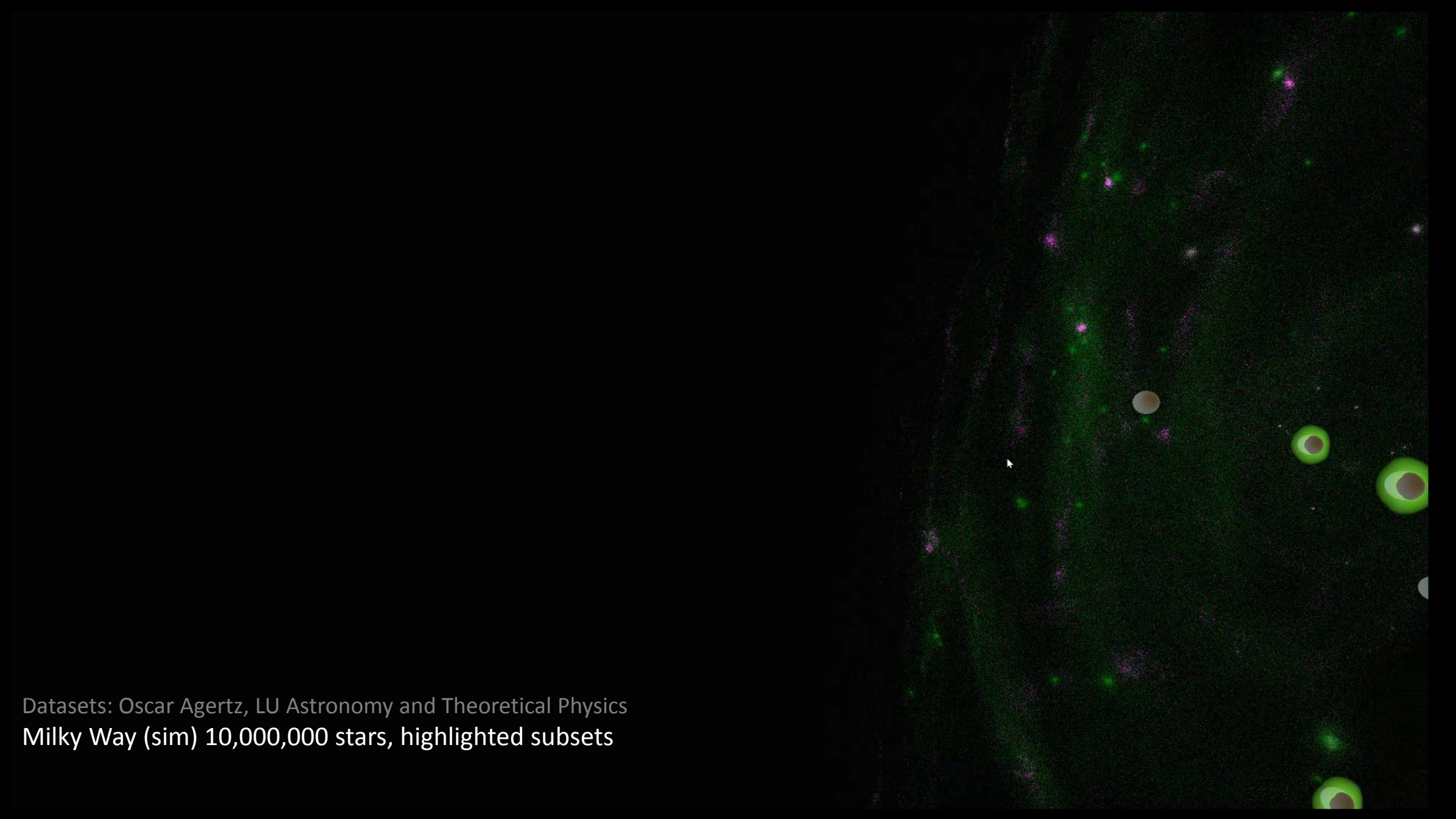
Joakim Eriksson

Günter Alce

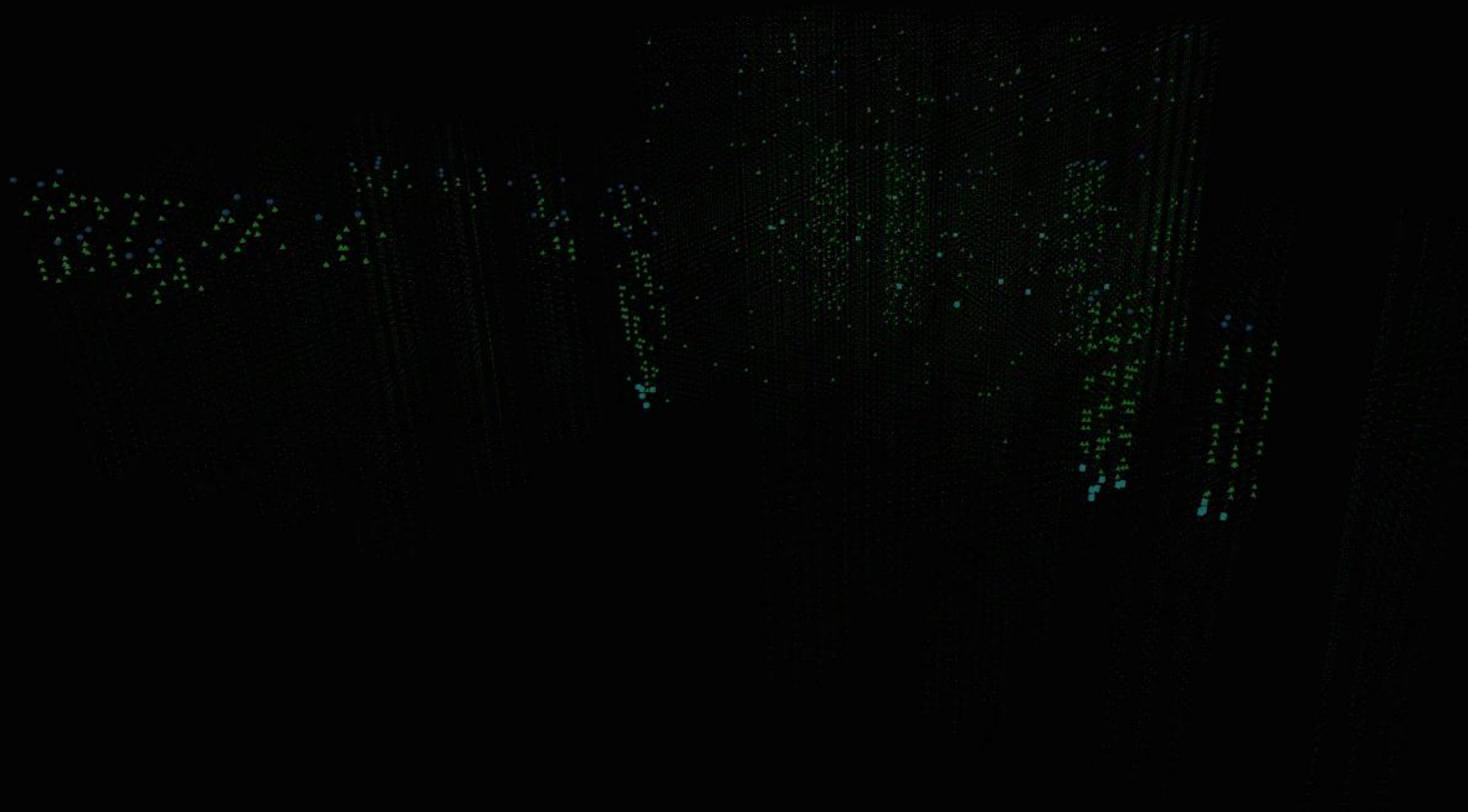
Mattias Wallergård

Simon Holk





Datasets: Oscar Agertz, LU Astronomy and Theoretical Physics
Milky Way (sim) 10,000,000 stars, highlighted subsets



Data sets: Anders Lansner, Tino Weinkauf, et al, KTH, Computational Brain Science Lab
Brain (sim) 2x2 mm Geometry: 1,485,251 Spike events: 10,836,157 18 s

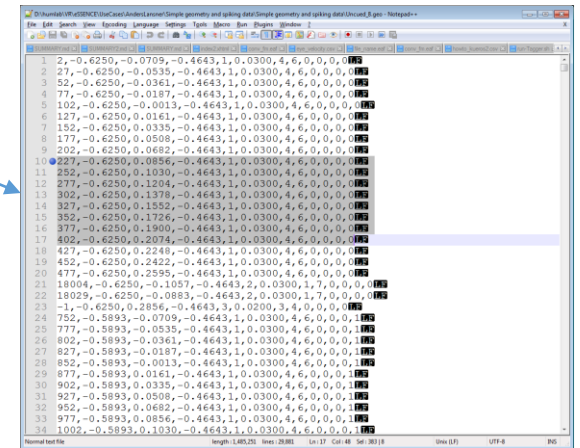
Curtesy of data suppliers!

- Oscar Agertz, LU Astronomy and Theoretical Physics
- Alexey Bobrick, LU Astronomy and Theoretical Physics
- Joanne Yager, LU Centre for language and Literature
- Jonas Ahlsted, LU Bioimaging Centre (LBIC)
- Paul Bourguine, LU Molecular Skeleton Biology
- Anders Lansner, Tino Weinkauf, et al, KTH, Computational Brain Science Lab
- Kate Mesh, LU Centre for language and Literature
- Giorgi, LU Astronomy and Theoretical Physics
- Daniel Nilsson, LU Theoretical Physics

See you post pandemic!

VR framework concept

- Walk-in dataset
 - Simple datasets are recognised
 - Complex datasets are guided outside the VR-headset
 - Some datasets needs readiness processing
 - Use favorit data editor or IDE to do subsettings
 - .xml project file provided to save preferences
- Starter's Kit
 - Data samples for users
 - Code samples for programmers
- Entry level:
 - As easy as reading and plotting a dataset using Python



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```

LU VR teams

3D/VR Studio @ LU Humanities Lab

VR lab @ Design Sciences

Soneji Lab @ Faculty of Medicine /BMI

DARK Lab @ Archaeology

Thanks!

henrik.garde@humlab.lu.se