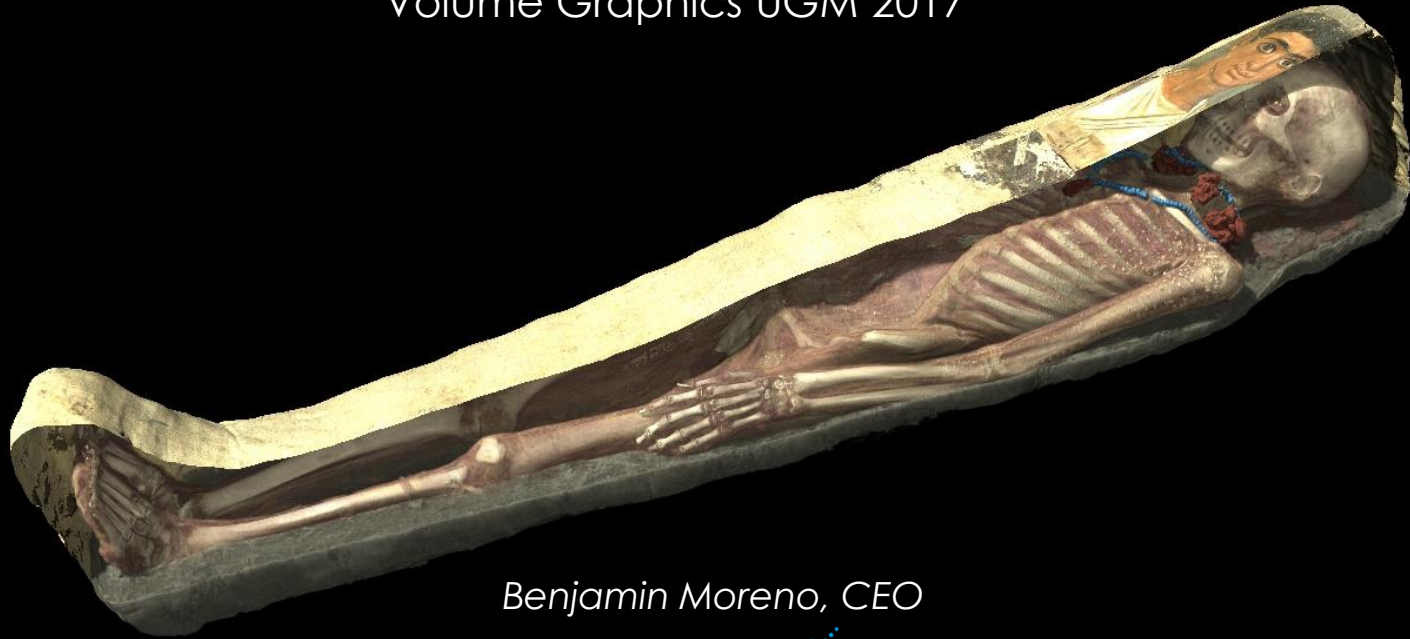


MIXING VOXELS & TEXTURED MESHES

THE PERFECT COMBINATION

Volume Graphics UGM 2017



Benjamin Moreno, CEO

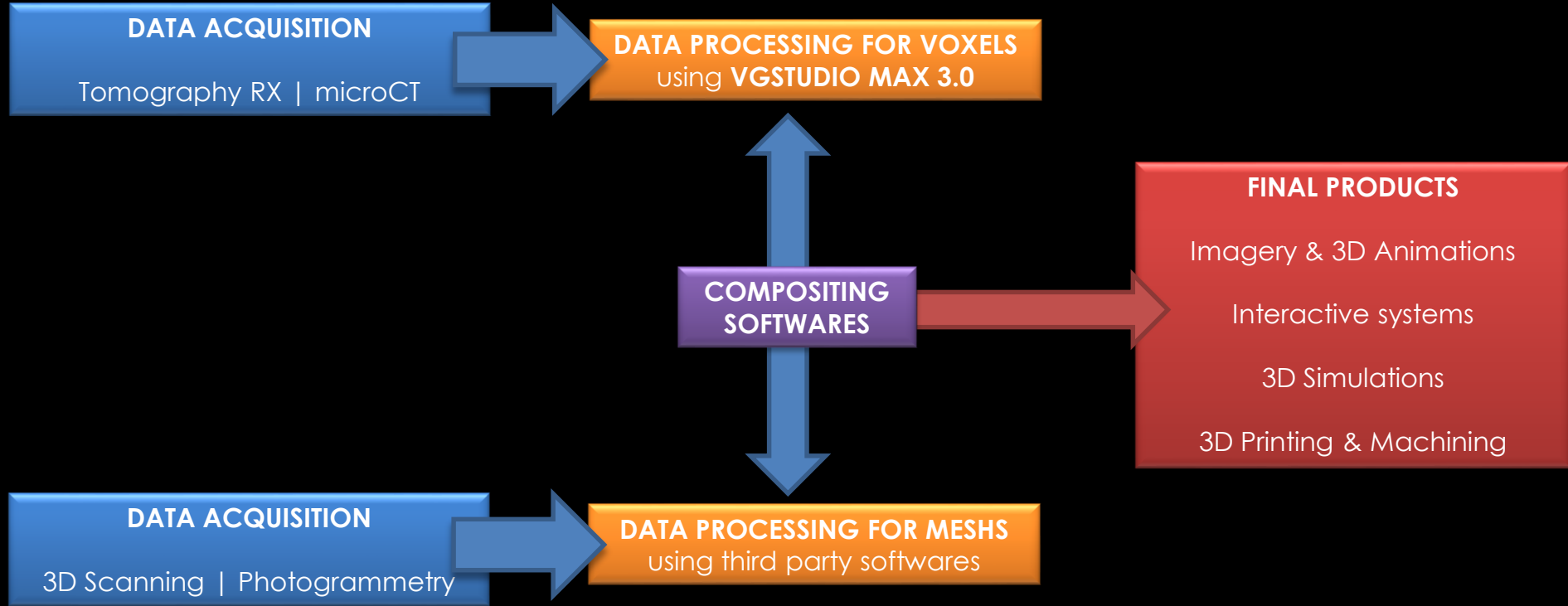
IMA Solutions
3D scanning & multimédia

SARL IMA Solutions, 19 rue Jean Mermoz 31100 Toulouse, France
Phone: +33 (0) 675 761 567 Email: contact@ima-solutions.fr Web: www.ima-solutions.fr

MUSEUMS, ARCHEOLOGY & SCIENCE CENTERS



ACTUAL WOKFLOW & LIMITATIONS for mixing volumes & textured meshes



Tricky process!

UPCOMING WORKFLOW & EXTENDED POSSIBILITIES WITH VGSTUDIO MAX 3.1

3D DATA ACQUISITIONS

Tomography | MicroCT

3D scanning

Photogrammetry

...



DATA PROCESSING
of Voxels and Textured Meshs
using **VGSTUDIO MAX 3.1**



FINAL PRODUCTS

Imagery & 3D Animations

Interactive systems

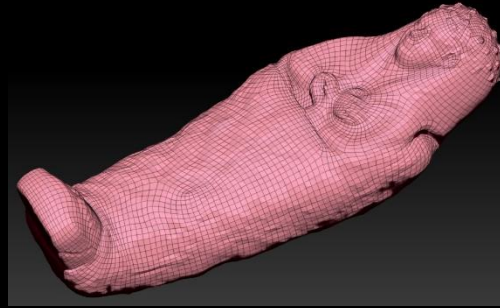
3D Simulations

3D Printing & Machining

TYPICAL 3D SCANNING WORKFLOW



3D scanning using Artec3D scanners
©The Trustees of The British Museum



Polygonal Mesh = external geometry

+



DiffuseMap = colors of the object



Textured polygonal Mesh

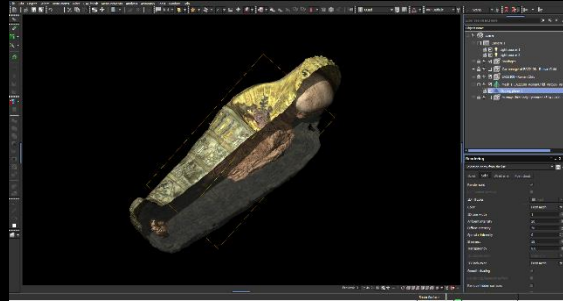
MIXING DATAS WORKFLOW



CT scanning using Medical scanners
©The Trustees of The British Museum



Textured polygonal Mesh

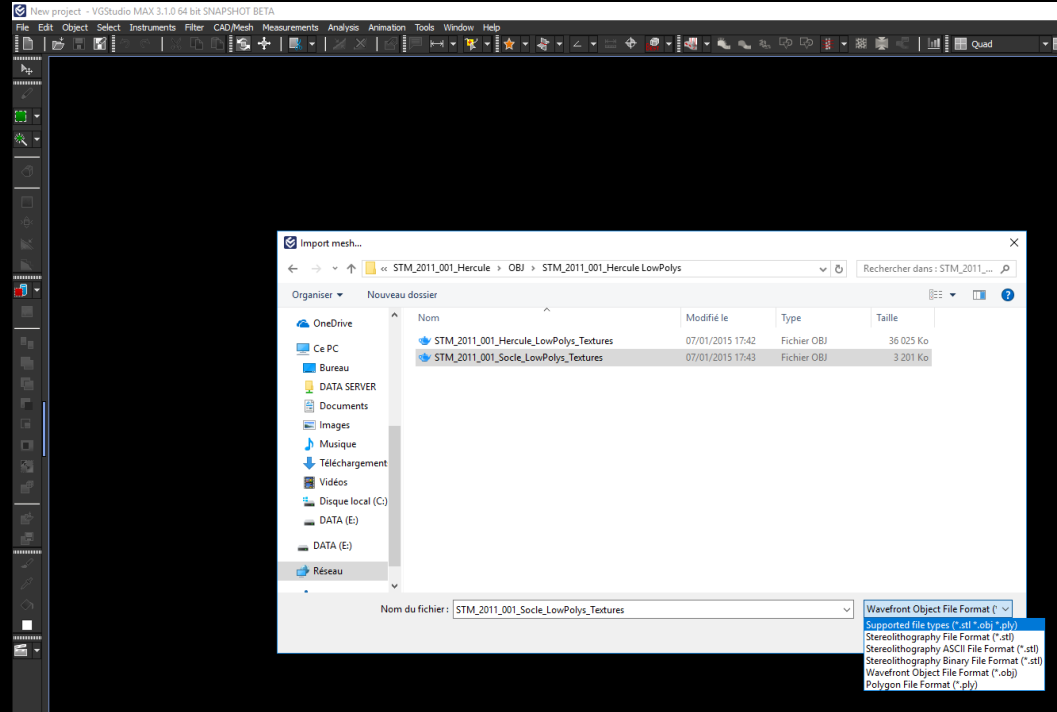
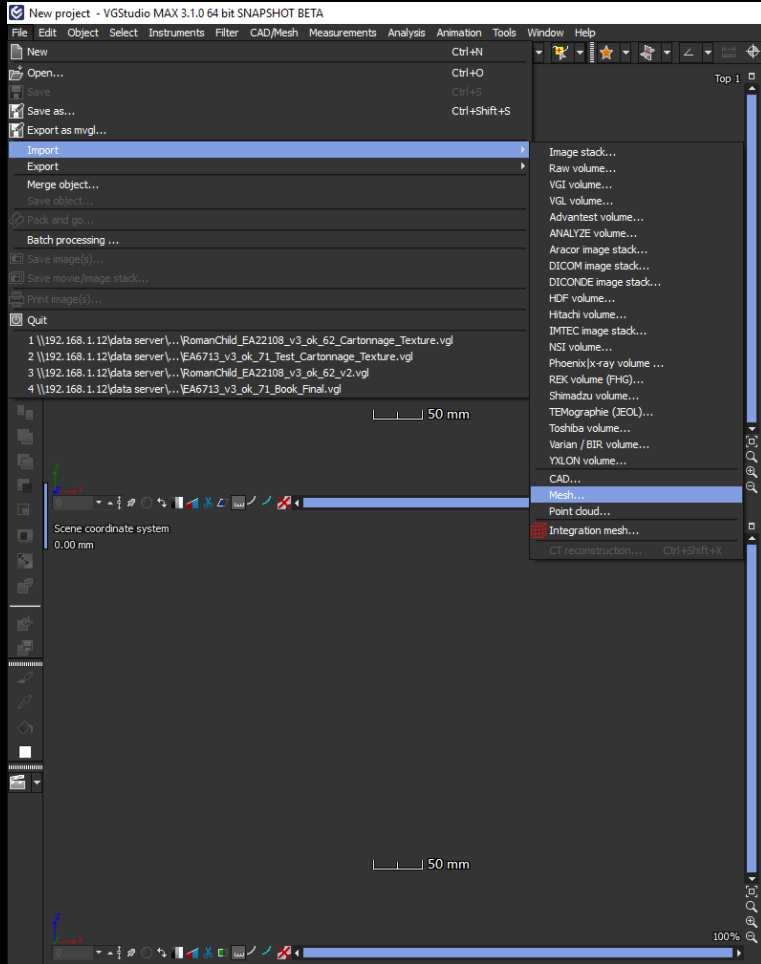


Mixing the data into VGSTUDIO MAX 3.1



Final 3D animations in exhibition space

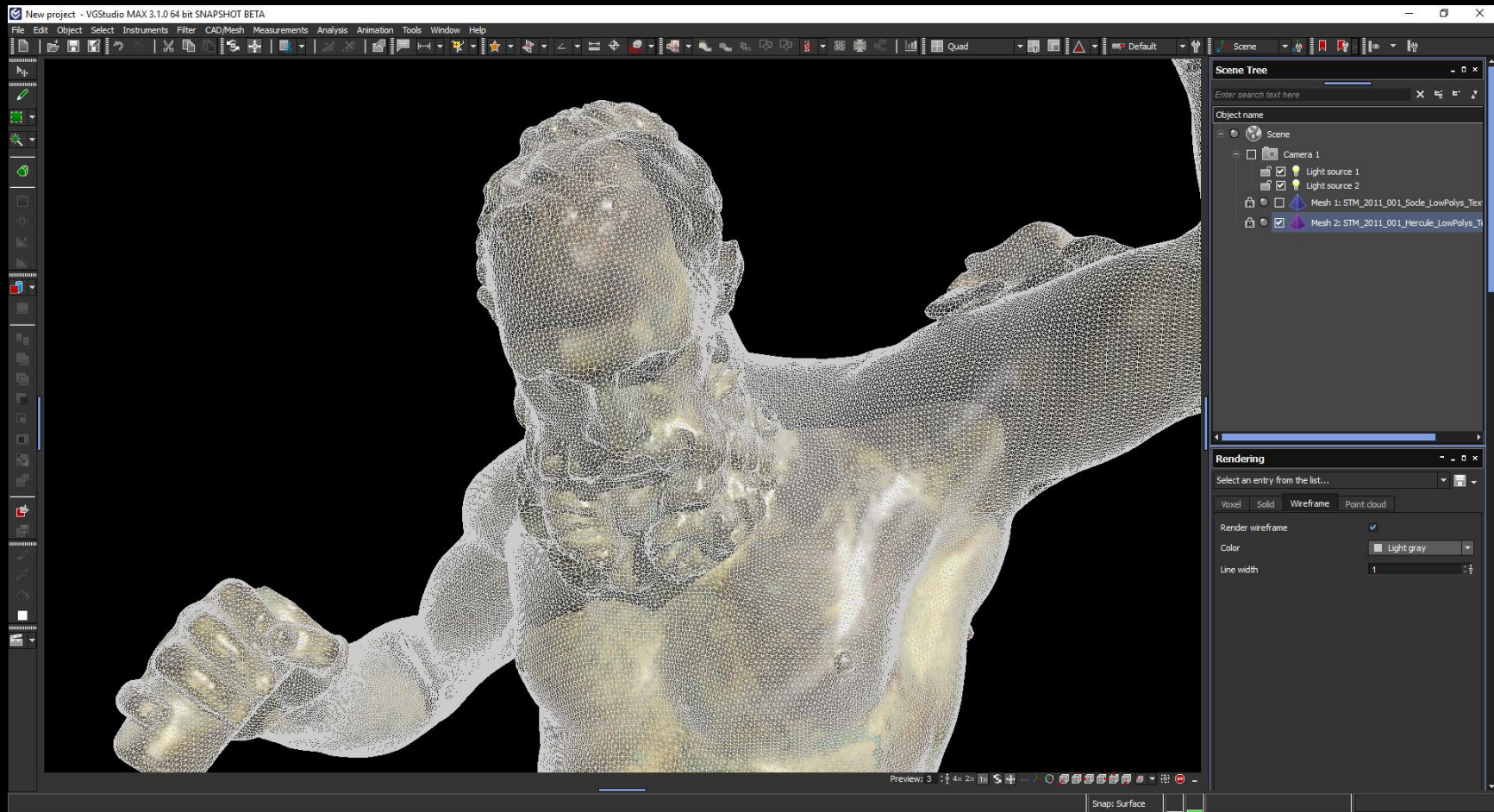
IMPORTING TEXTURED MESHES



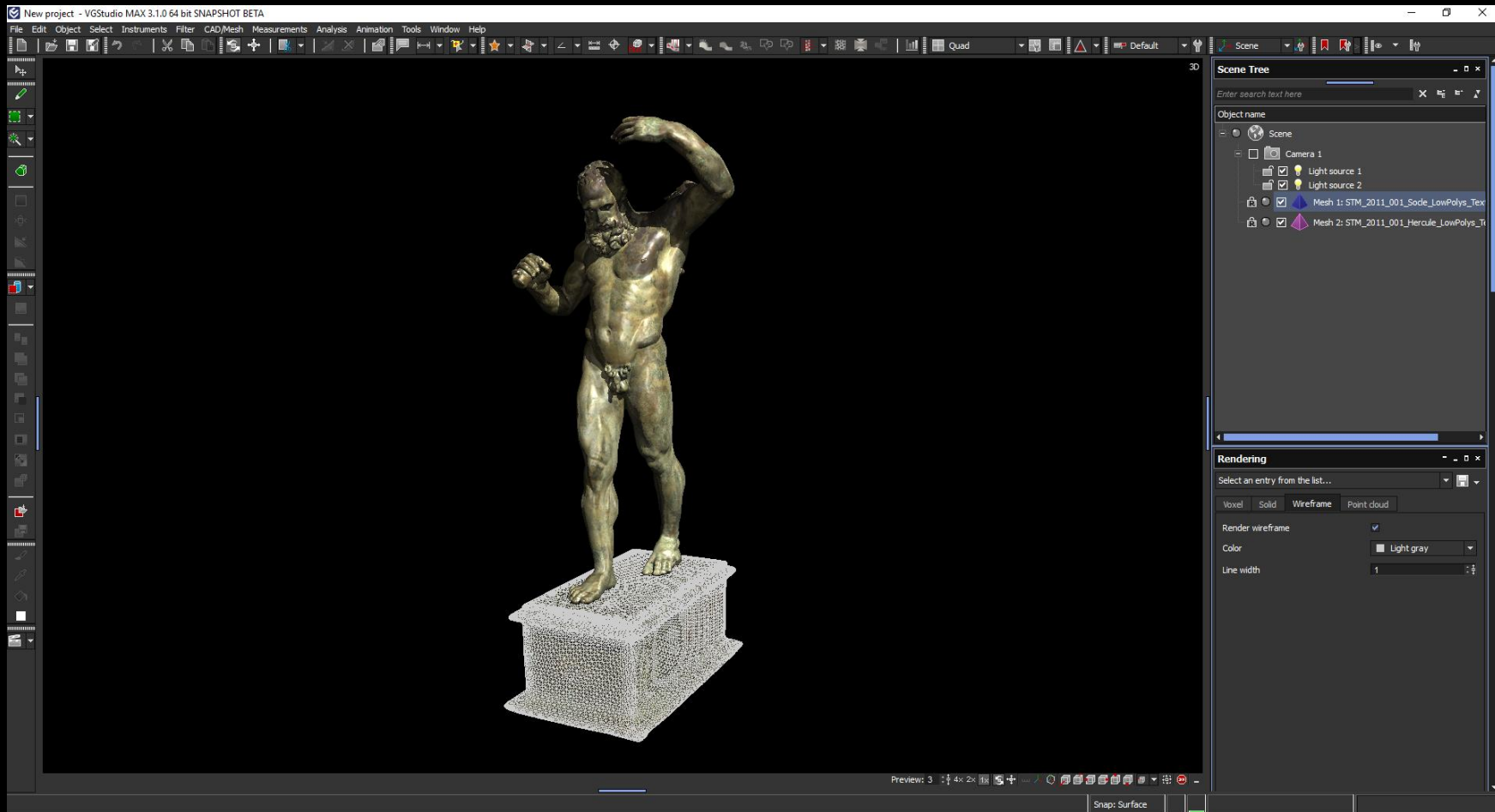
File > Import > Mesh...

Works with .obj file with Uvs and Texture File

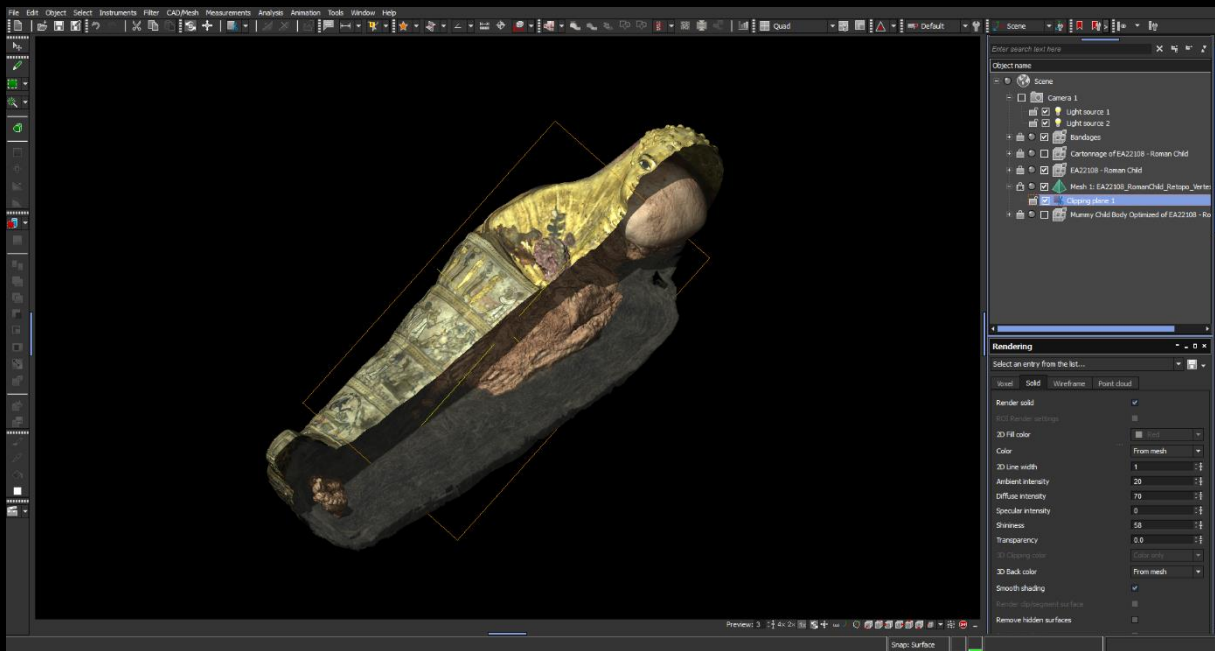
IMPORTING TEXTURED MESHES



MULTIPLE IMPORTED TEXTURED MESHES

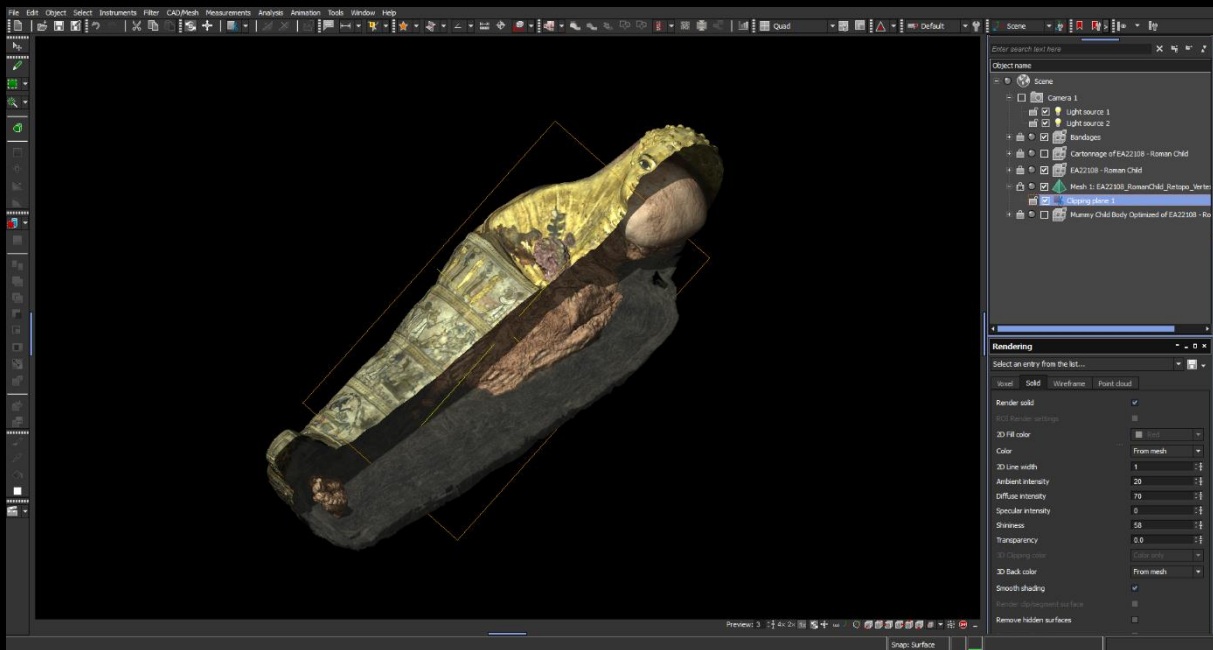


ALIGN VOLUMES AND TEXTURED MESHES



... by using **Surface Determination** and then **Registration Tools** (Best Fit, Feature based,...)

MIXING VOLUMES AND TEXTURED MESHES



Rendering

Select an entry from the list...

Voxel Solid Wireframe Point cloud

Render solid

ROI Render settings

2D Fill color

Color

2D Line width

Ambient intensity

Diffuse intensity

Specular intensity

Shininess

Transparency

3D Clipping color

3D Back color

Smooth shading

Render dip/segment surface

Remove hidden surfaces

Swap inner/outer areas

Normalize gradients

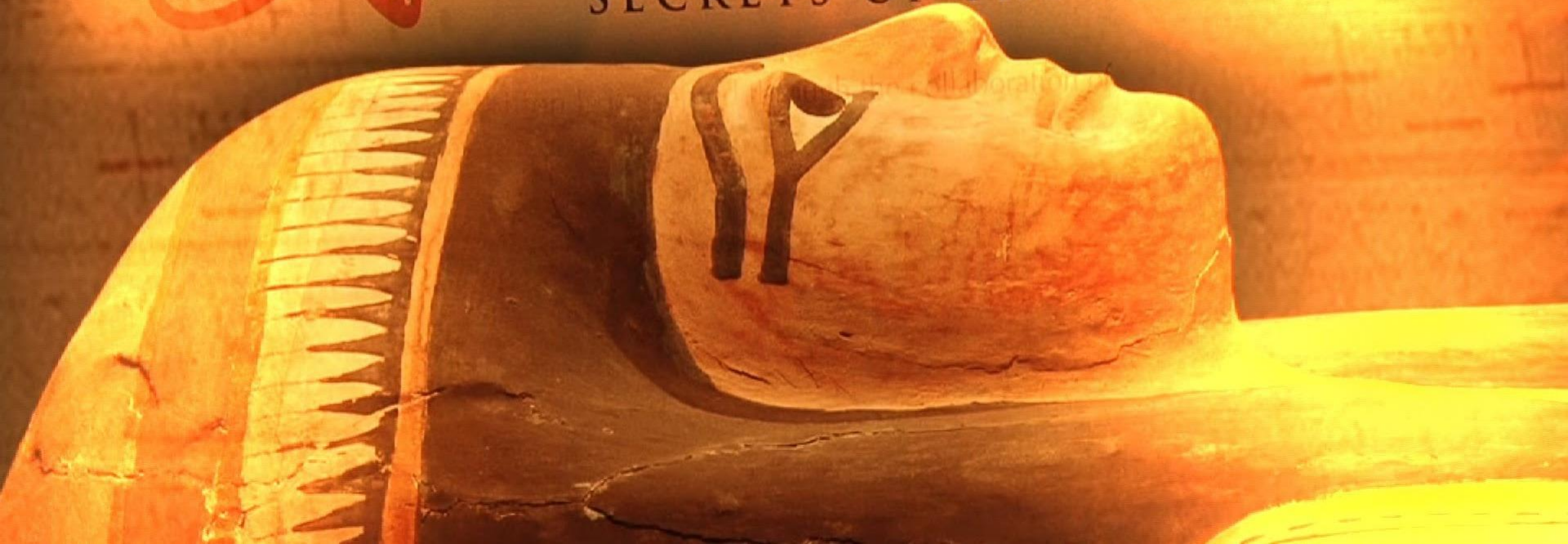
All parameters apply as for Volumes:

- Light orientation and Shadowing
- Cutting planes and boxes
- Measurements, alignments,...



MUMMY

SECRETS OF THE TOMB



Ancient lives new discoveries

Technology Partner

The British
Museum



CASE STUDY 1: Egyptian Mummies



A young child from Hawara

Sex: male

Age at death: 2 years \pm 9 months

Length: 85.5 cm

Date: Roman period, AD 40-60

Findspot: Hawara, Egypt

Acquisition details: Found during Excavations by W.M.F. Petrie in 1888.
British Museum EA 22108



A young man from Roman Egypt

Sex: male

Age at death: 17 – 20 years

Approximate height: 149 cm

Date: Roman period, AD 140 - 180

Findspot: probably from Thebes

Acquisition details: Purchased from Henry Salt's first collection, 1823.
British Museum EA 6713

The British
Museum

CASE STUDY 2: Early hominid fossils



Cradle of Humankind, South Africa
UNESCO Heritage Site
Prof. José Braga, Toulouse University

Web: <http://www.kromdraai-origins.org/>



CASE STUDY 2: Early hominid fossils



**Cradle of Humankind, South Africa
UNESCO Heritage Site**

Skull of Mrs Ples – STS-5

Most complete *Australopithecus africanus* skull

2,05 million years old

Found the 18th of April 1947 by Robert Broom

Housed at the Transvaal Museum in Pretoria

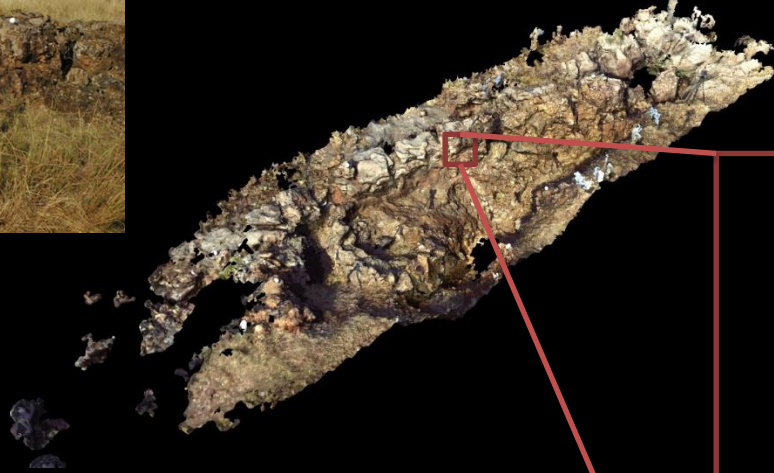
Acquisitions : microCT + 3D colored surface scanning



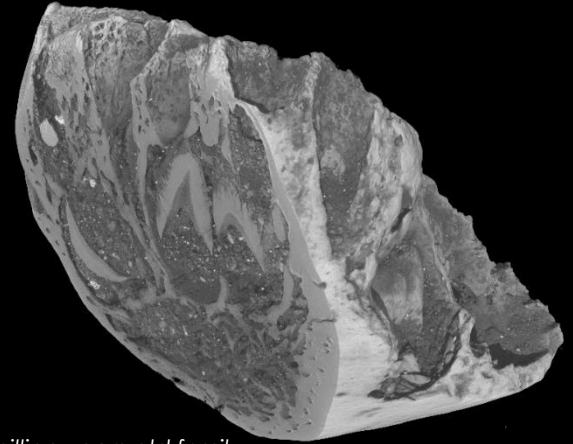
CASE STUDY 2: Early hominid fossils



CASE STUDY 3: Multiscale From Archeological Site to Fossil

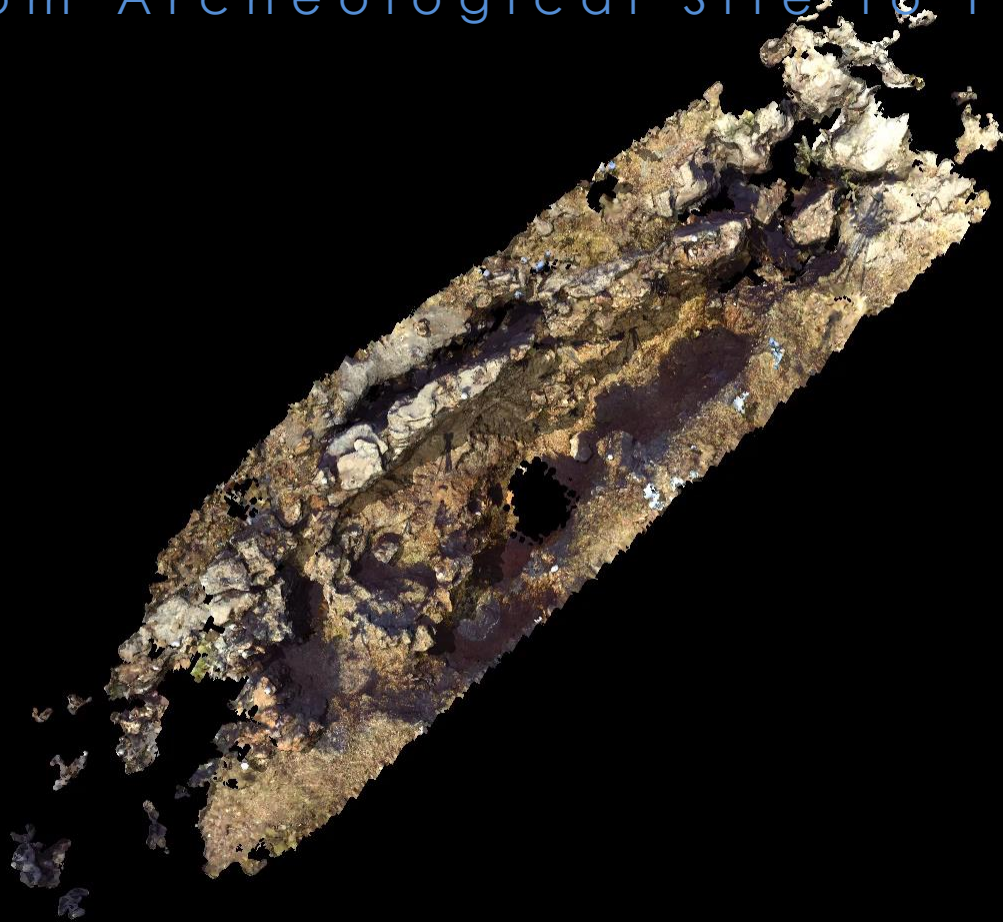


*Kromdraai UNESCO archeological site: 100 meters
3D model using long range Faro Focus laser scanner*

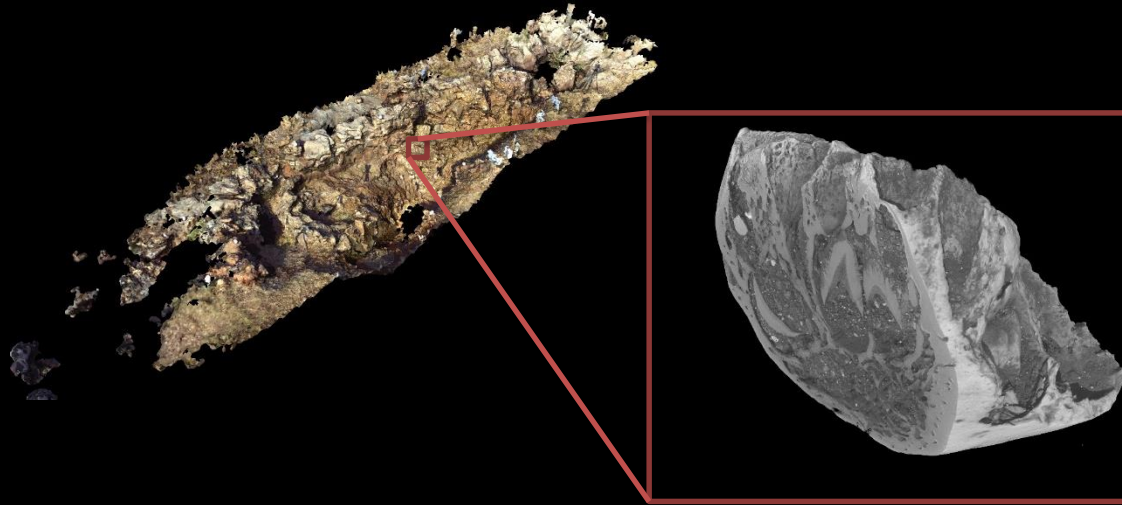


*A 2 million years old fossil
mandibula found on site: 7 cm
microCT datas*

CASE STUDY 3: Multiscale
From Archeological Site to Fossil



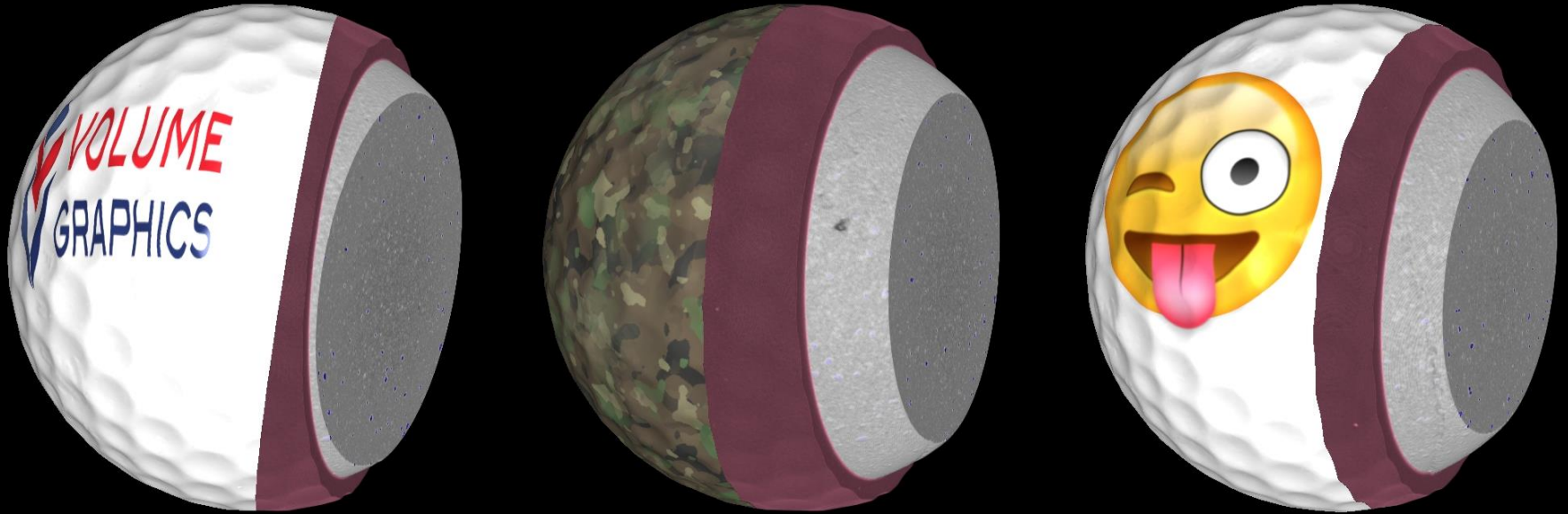
CASE STUDY 3: Multiscale From Archeological Site to Fossil



Manage heterogenous datas in the same scene:

- 3D long range scanning for georeferencing and survey
- microCT for morphological analysis and classification

CASE STUDY 4: An example for Industry



Manage & Test different designs for your products

CONCLUSION

- Manage all 3D data types in one place
- Get complete surface and volume information
- Perform measurements following color information
- Pinpoint using colored areas of interest
- Product marketing: 3D images and 3D animations

