



Examination of structure and properties of historic glass with OCT

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OCT for art conservation

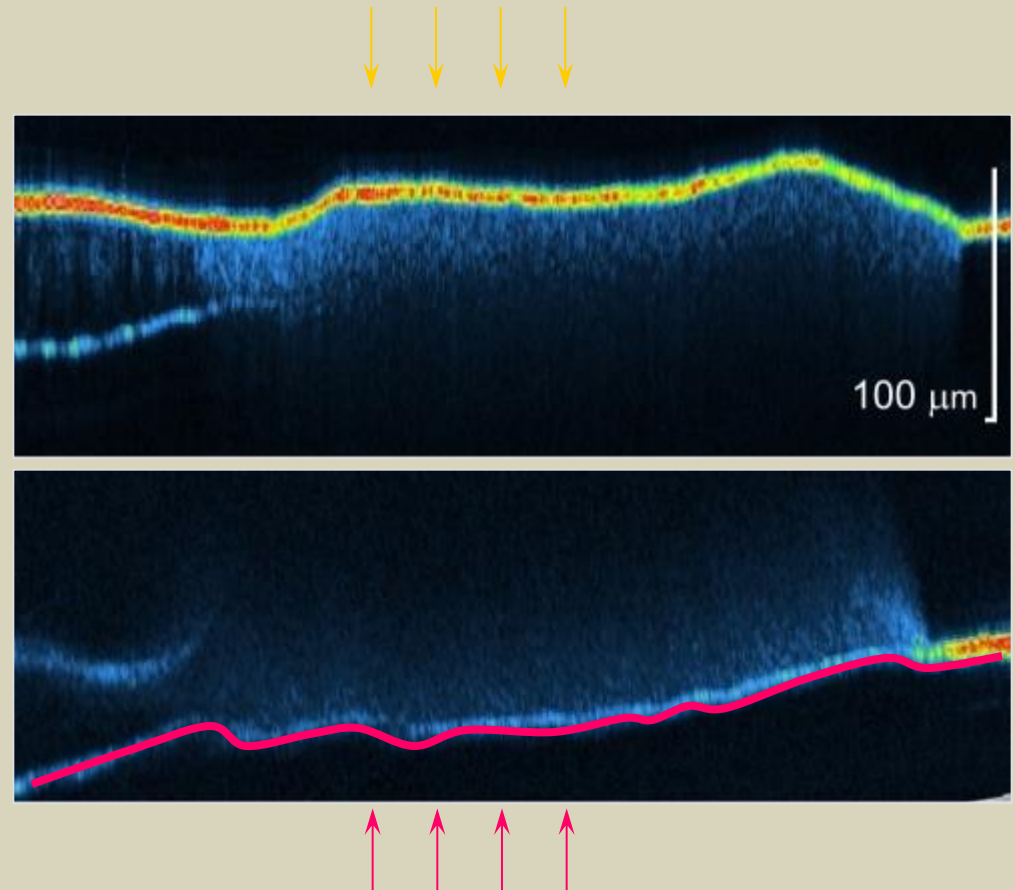
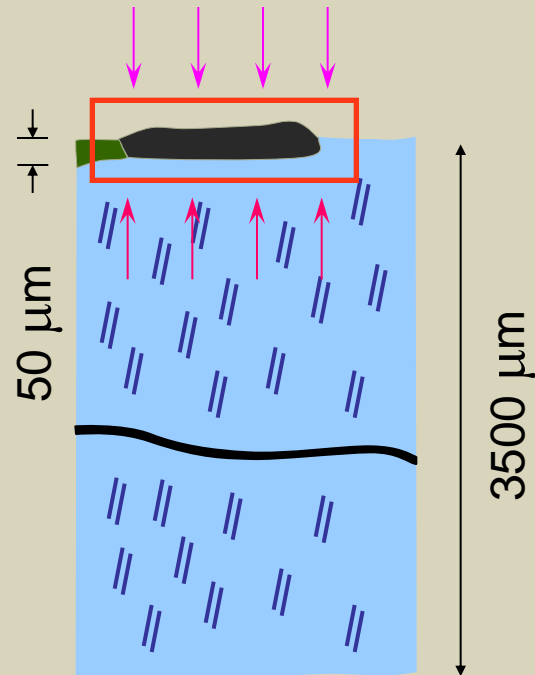
- structure examination:

- ✓ sequence and thickness of varnish and glaze layers of easel paintings
- ✓ absolute LIBS stratigraphy
- ✓ **destruction processes of historic glass**
- ✓ structure of objects with glass support
- ✓ structure and surface morphology of glazed ceramics
- ✓ structure of jades and similar materials
- ✓ examination of underdrawings
- ✓ volume rendering – 3D maps and profilometry

- real-time monitoring:

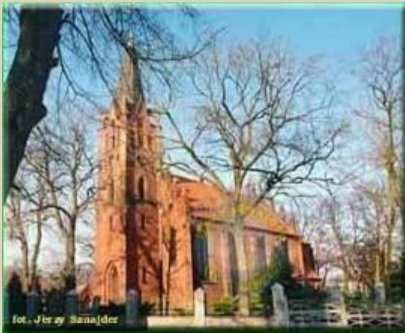
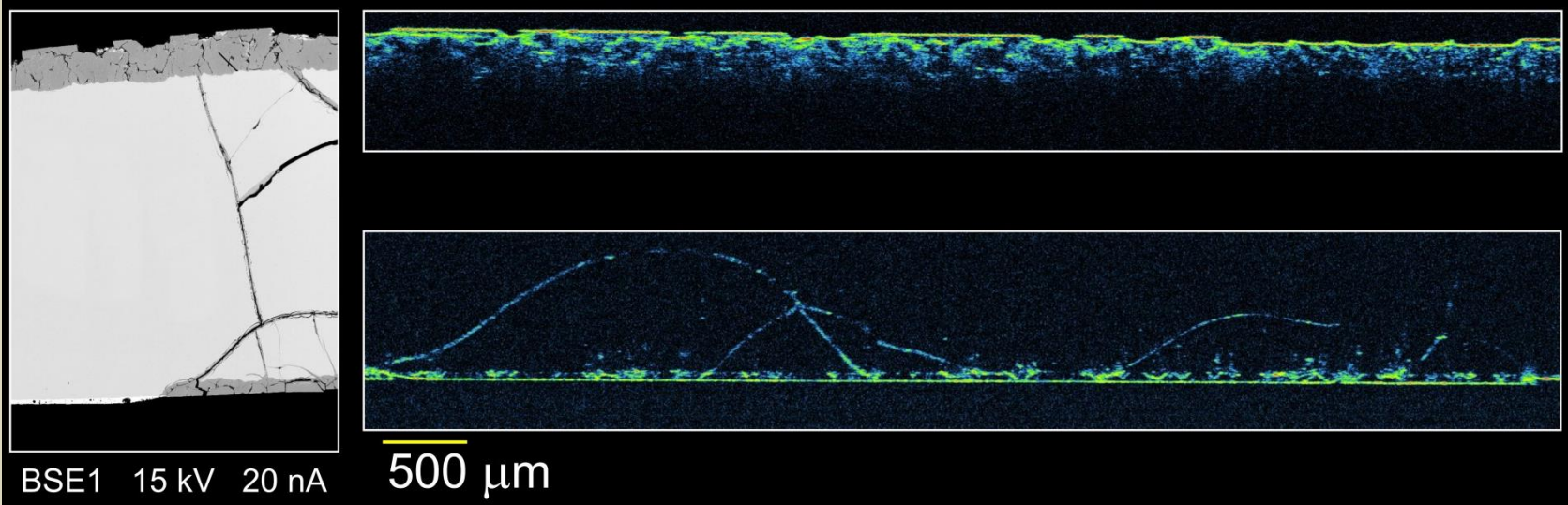
- ✓ monitoring of cleaning procedures, both chemical and by laser ablation of varnish
- ✓ tracking of canvas deformations under environmental stress

Structural imaging of stained glass



Piotr Targowski et al "Optical Coherence Tomography in Art Diagnostics and Restoration", *Applied Physics A* **92**, 1-9, (2008)

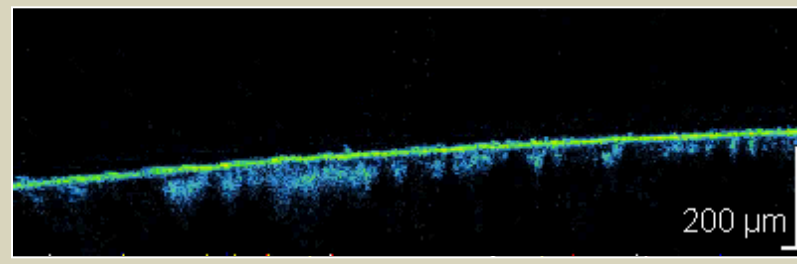
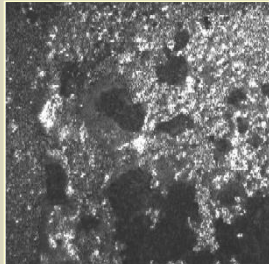
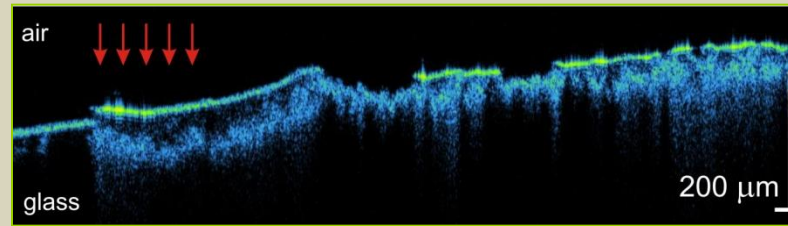
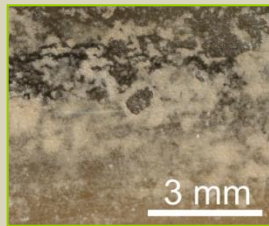
Atmospheric corrosion of glass



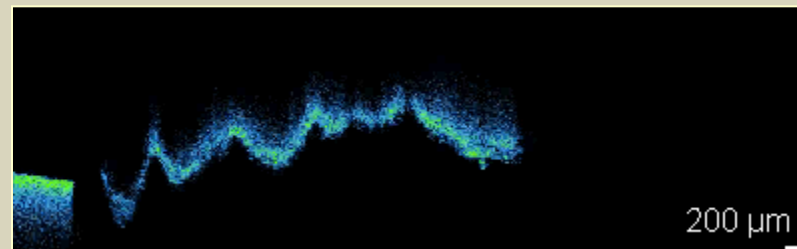
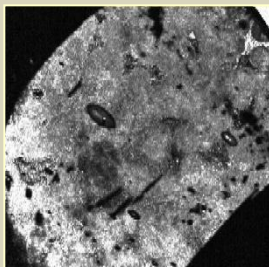
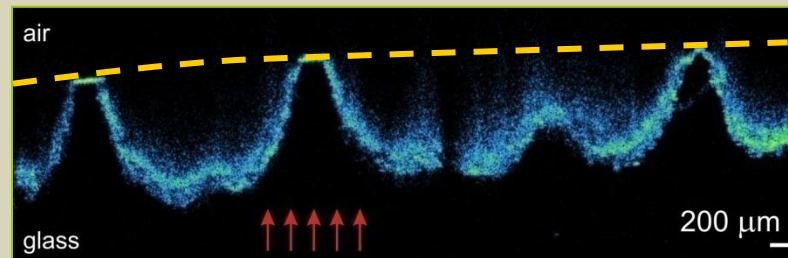
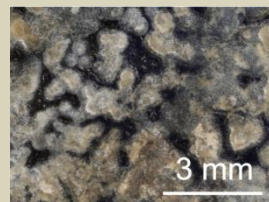
St. Nicolaus' church
in Powidz, XIX c.

J. Kunicki-Goldfinger, P. Targowski, M. Góra, P. Karaszkiwicz, P. Dzierżanowski „Characterisation of glass surface morphology by optical coherence tomography (OCT)” *Studies in Conservation* **54**, 117-128 (2009)

Destruction processes of historic glass



9 mm



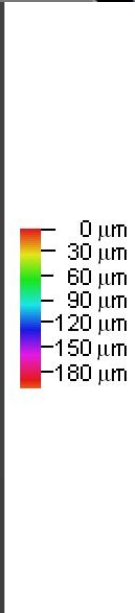
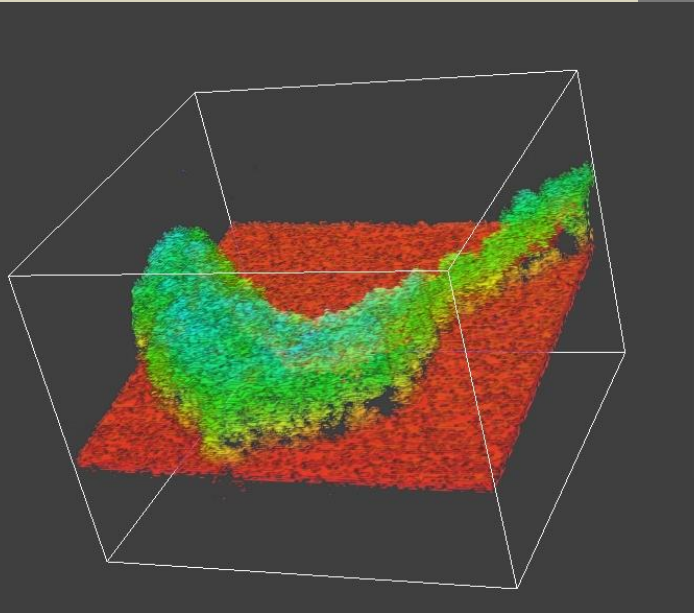
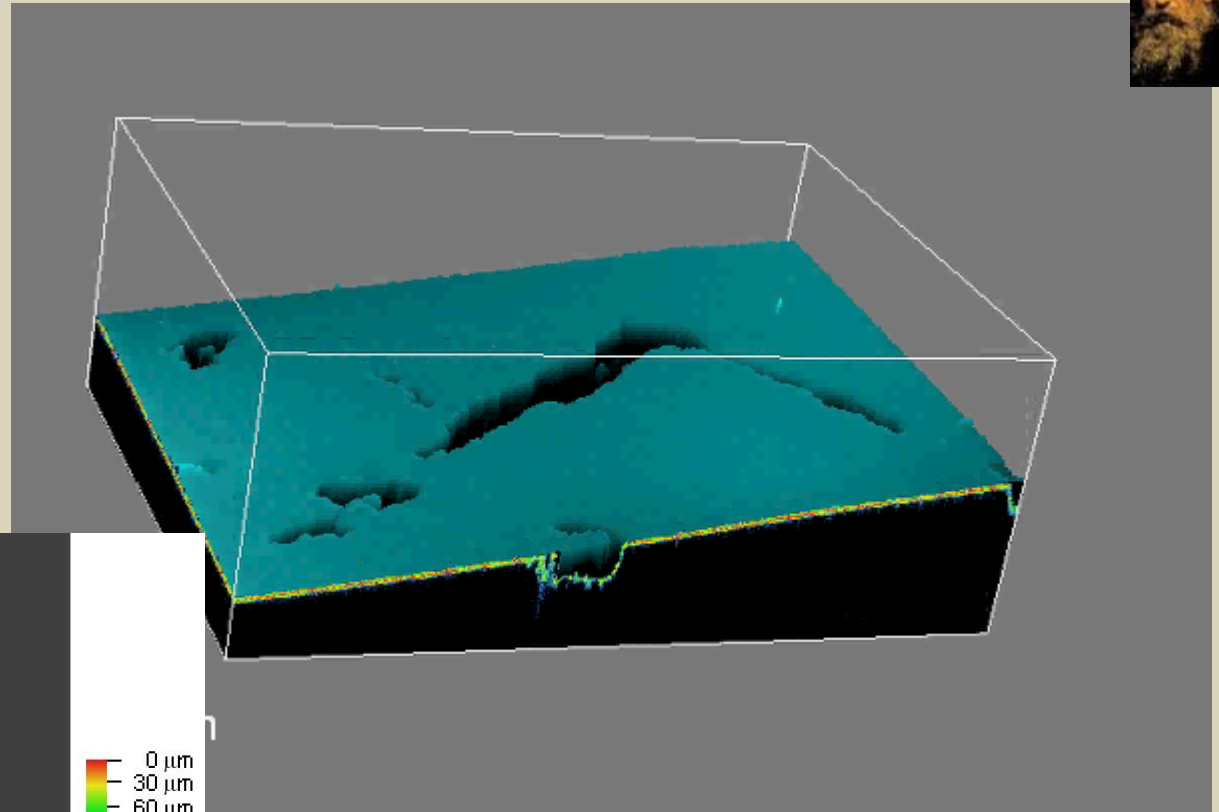
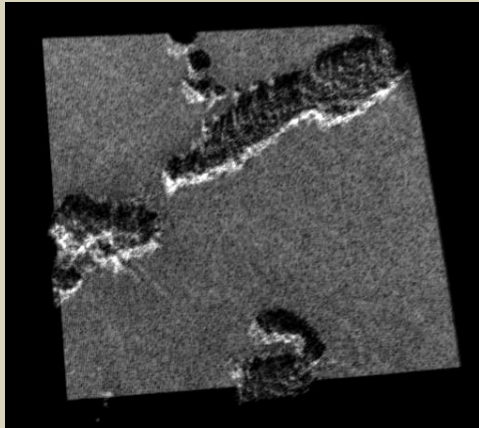
inner

outer

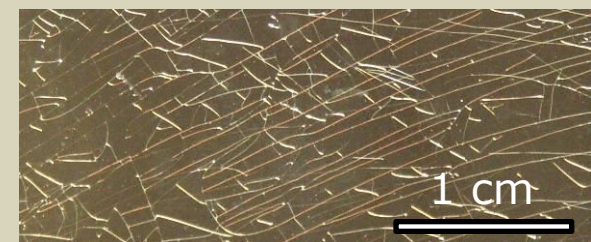
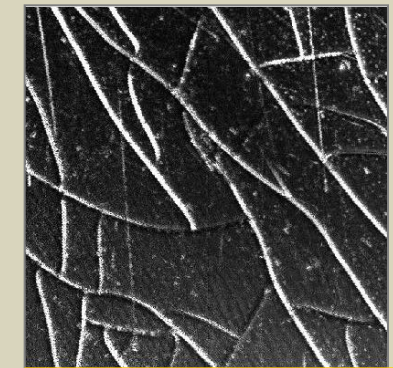
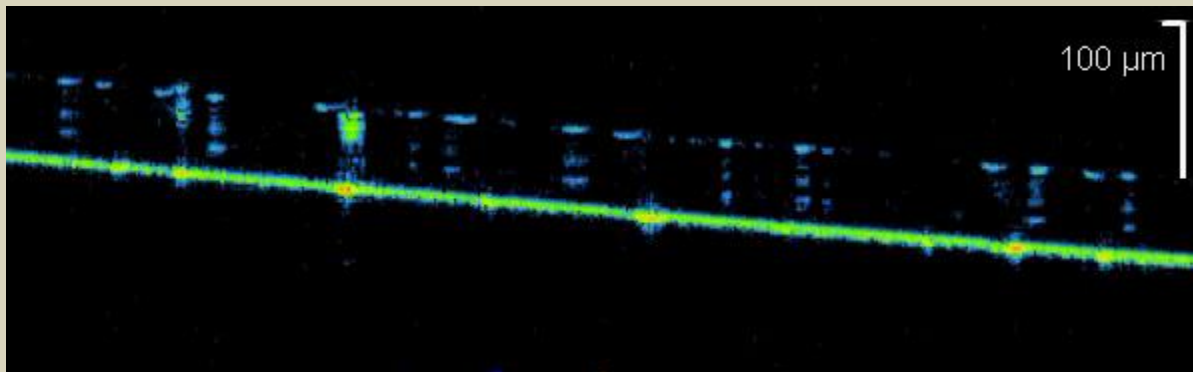
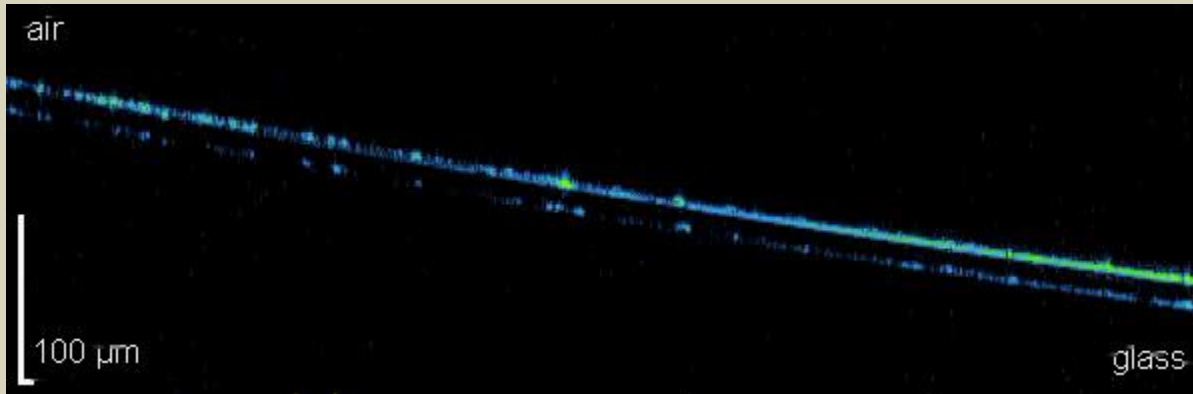
15th c. windows glass from St. Mary's Basilica in Kraków (Cracow, Poland)



Less developed pitting

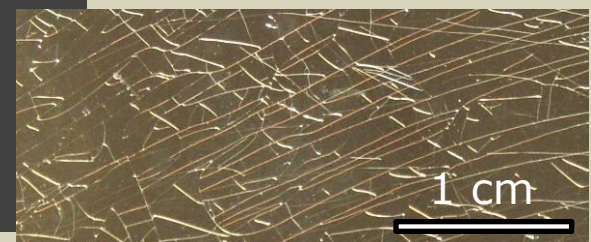
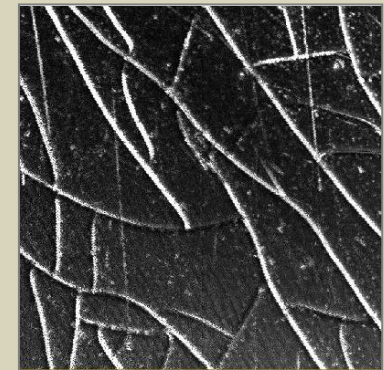
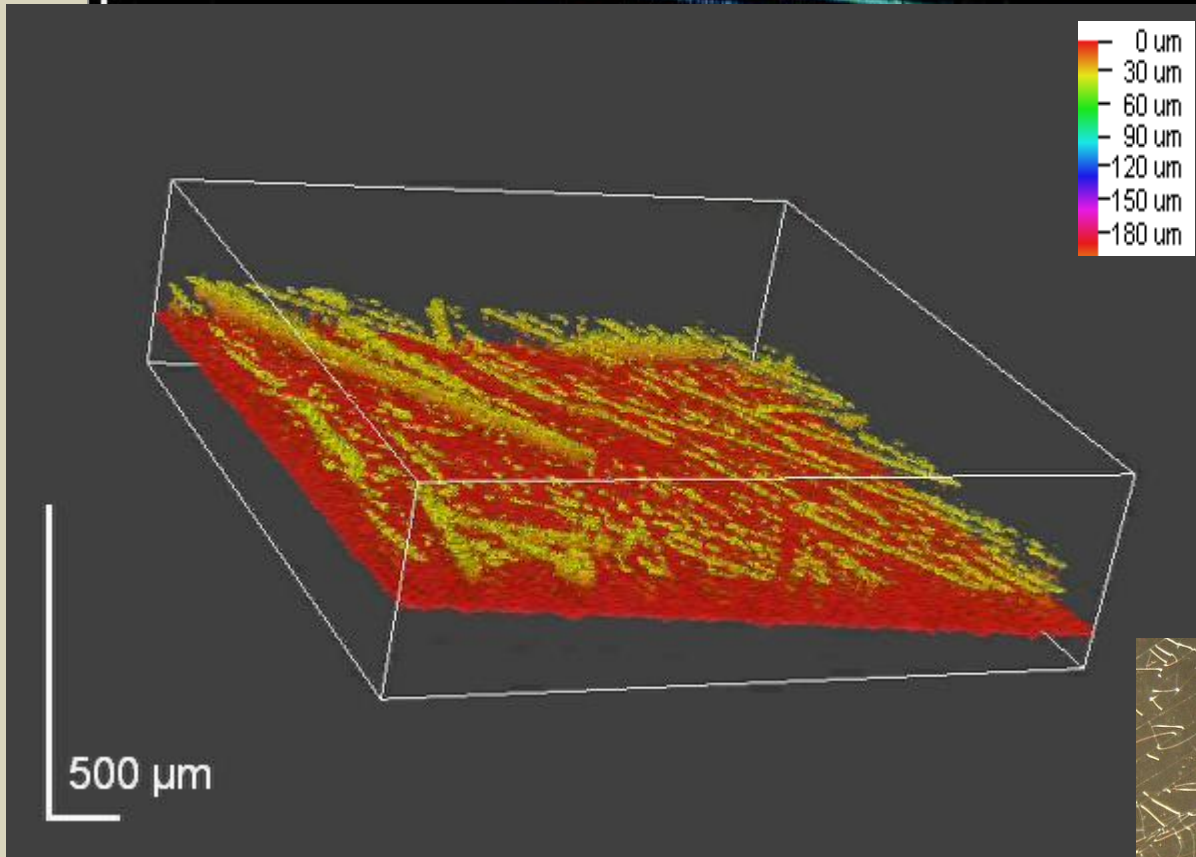
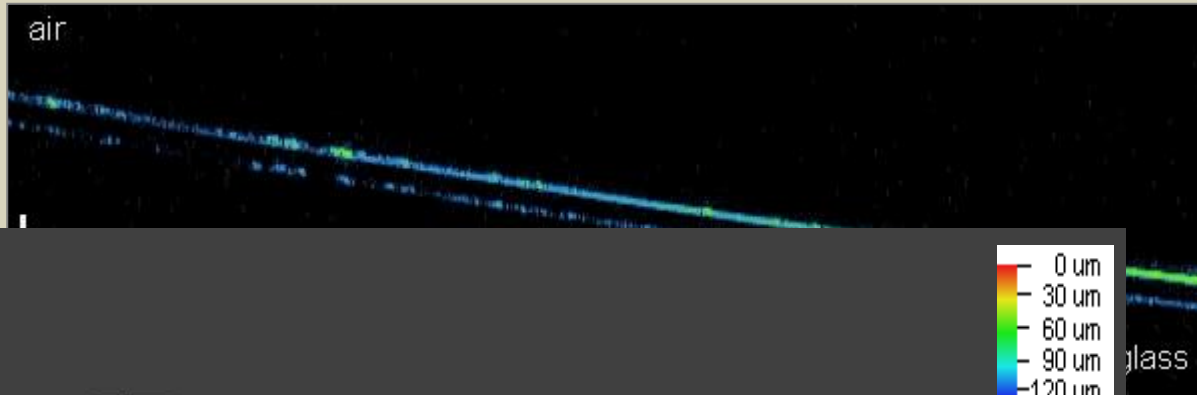


Crizzling

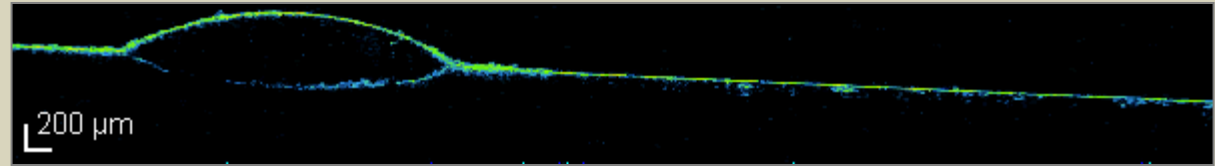


Samples courtesy of Ms Anna Pusowska,
National Museum in Cracow

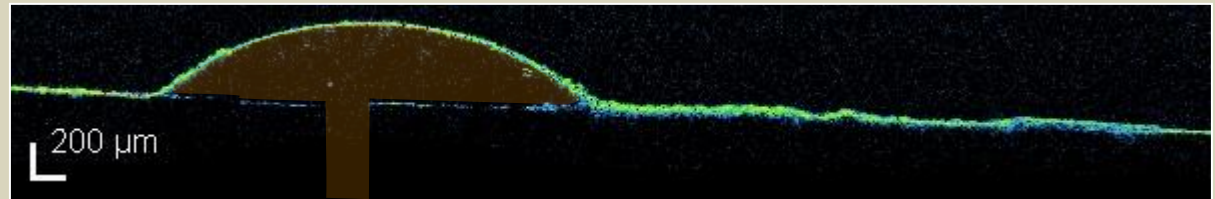
Crizzling



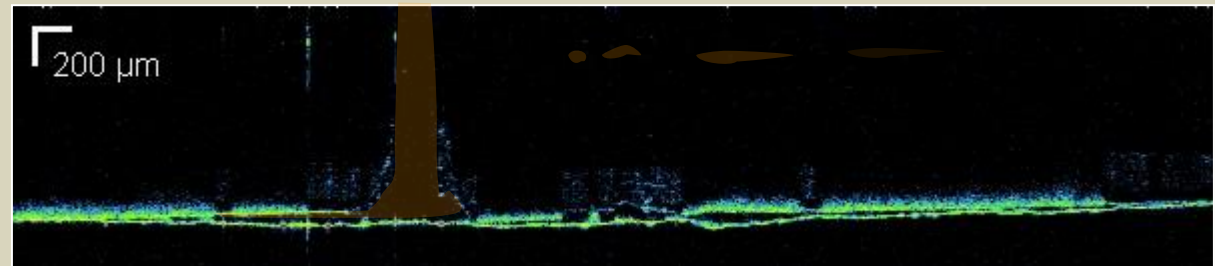
Inspection of conservation treatment



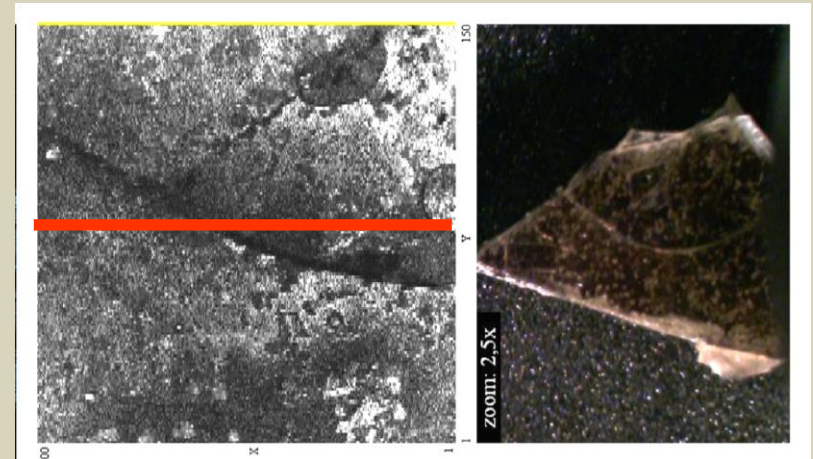
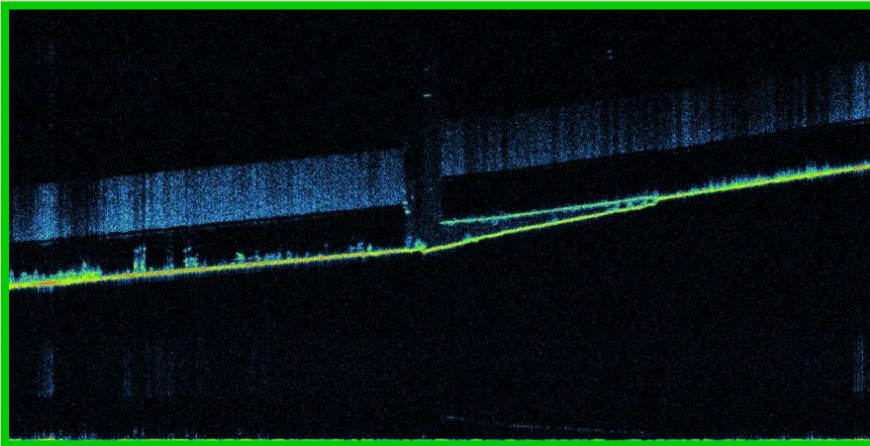
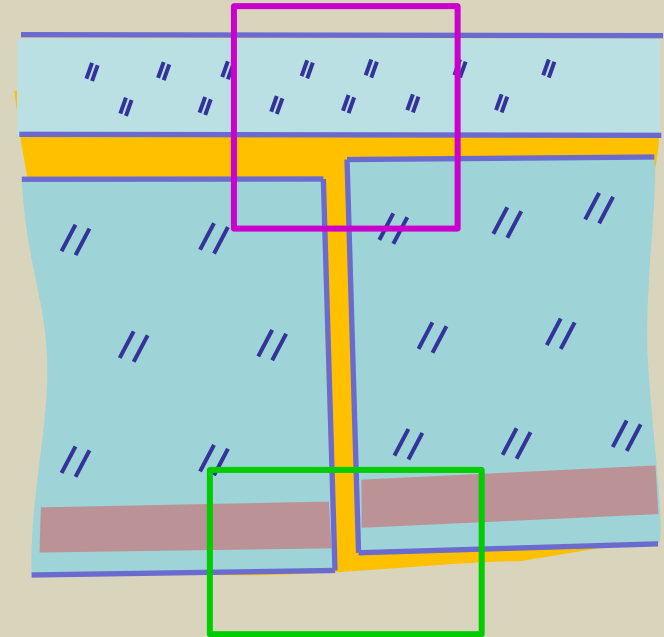
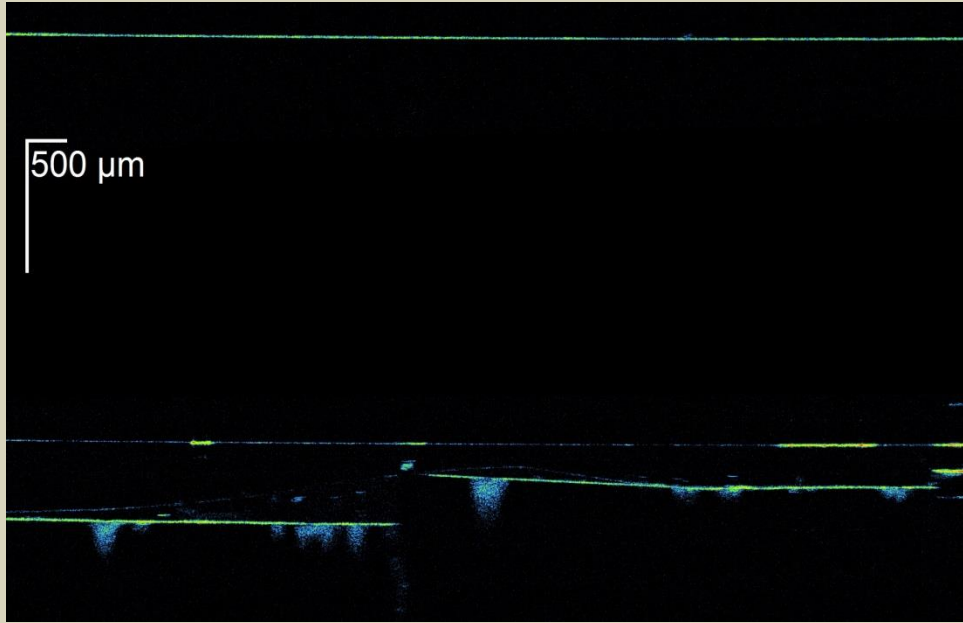
After correction for refraction



14th c. windows glass
from St. Mary's Basilica
in Kraków



Tracking of former conservations



OCT for art conservation

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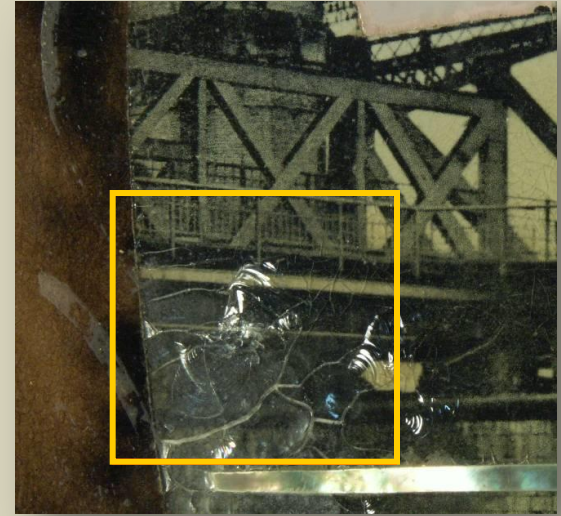
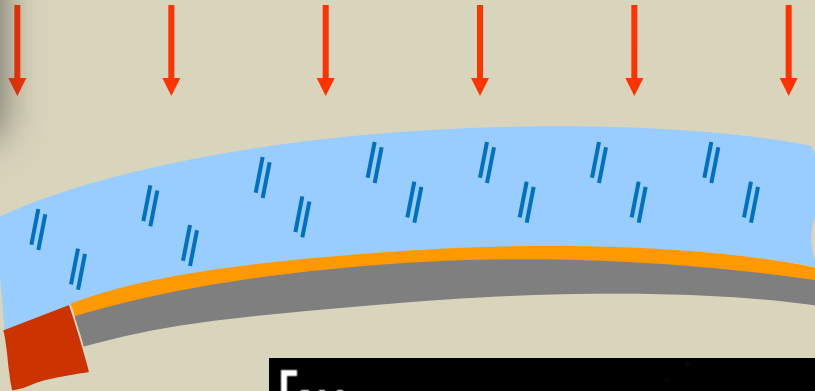
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
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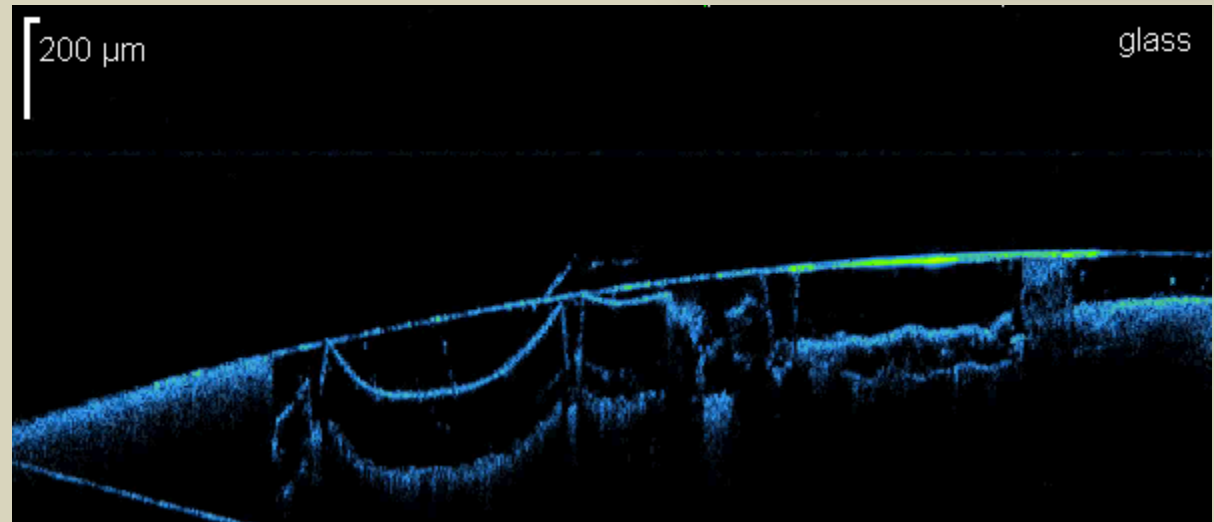
Inspection of structural damage of glass



View of the railway bridge in Torun
Late 19th century photographic
collage on reverse of glass



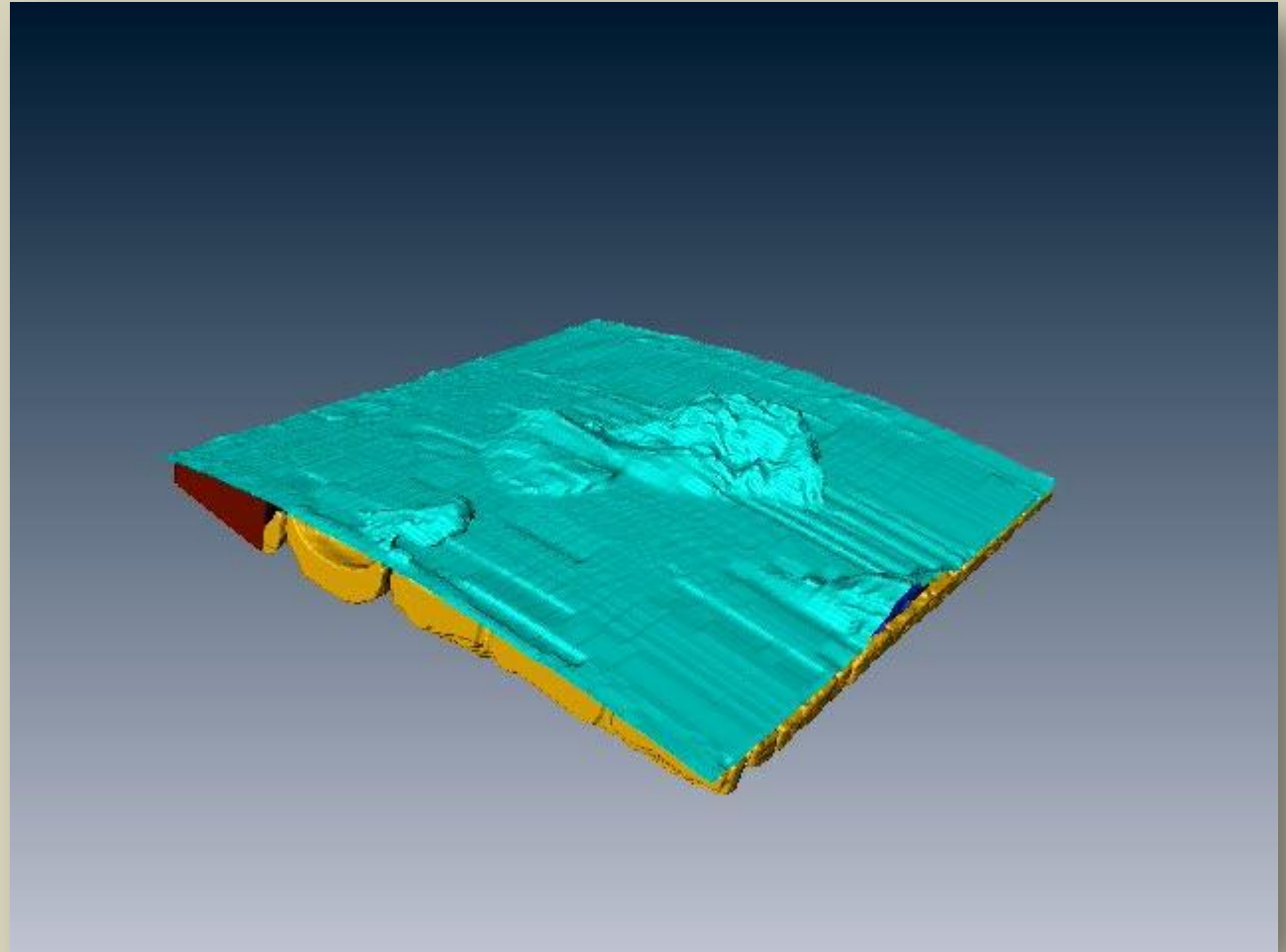
-  glass
-  glue
-  frame
-  paper print



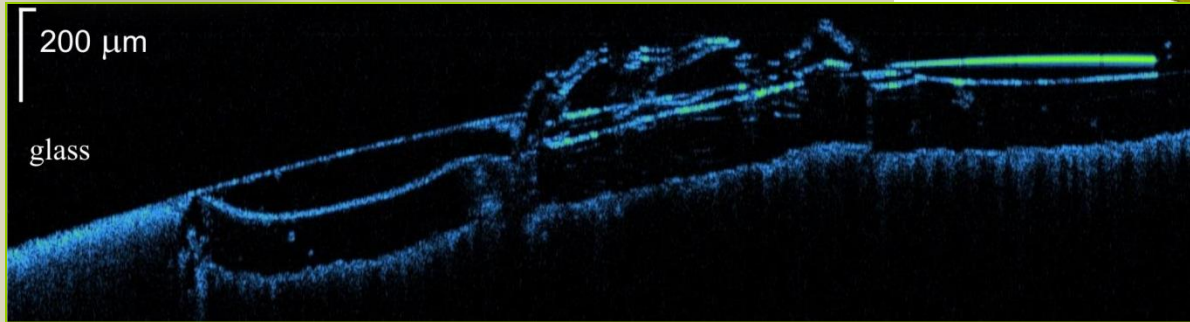
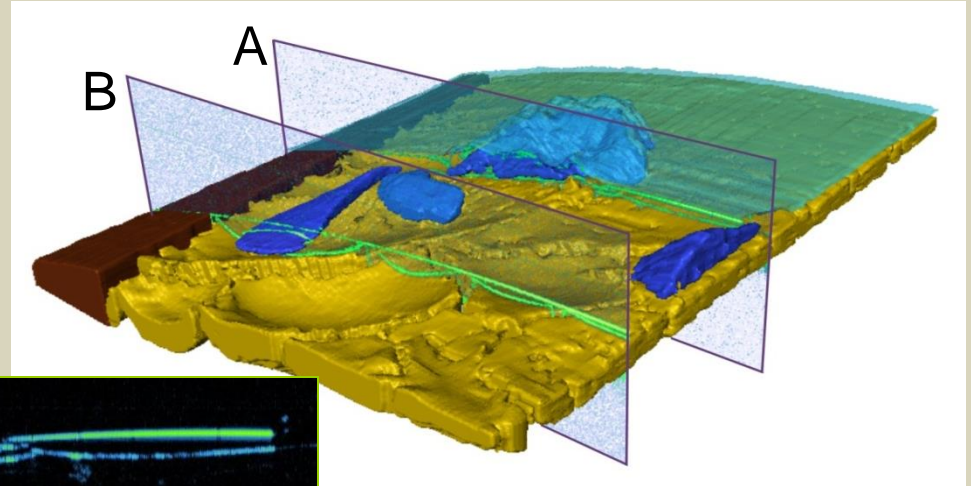
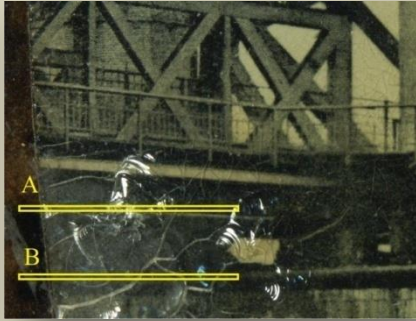
Inspection of structural damage of glass



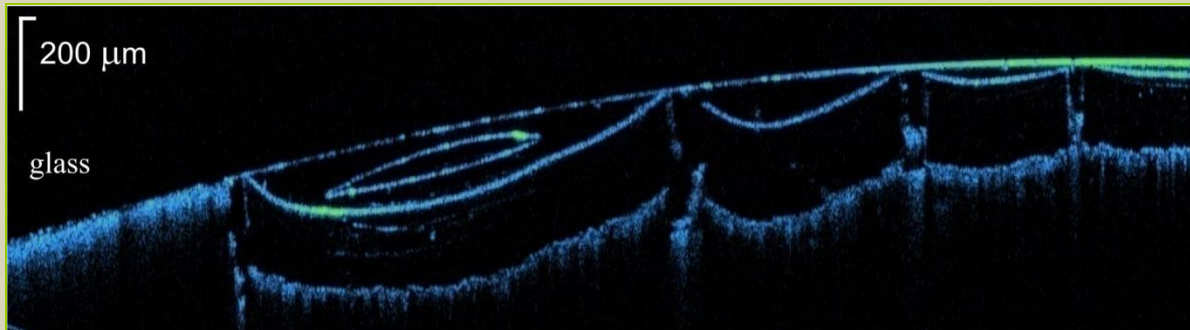
-  inner glass surface
-  loose pieces of glass
-  glue
-  frame




Inspection of structural damage of glass



A



B

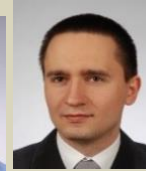
-  inner glass surface
-  loose pieces of glass
-  glue
-  frame

Acknowledgements



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