**Scientific cases for an infrared beamline at MAX IV, Uppsala 8-9, 2017**

**Name:**

*Per Uvdal*

**E-mail:**

*per.uvdal@chemphys.lu.se*

**Affiliation:**

*Chemical Physics, Dept. of Chemistry, Lund University*

**Scientific background and interest:**

*Spectroscopy of solid surfaces and matrixes*

*DFT modeling of vibrational spectra*

*Infrared beamline scientist at MAX-lab*

*Chemical imaging and microscopy*

*Molecular paleontology*

**Previous experimental experience at synchrotron facilities:**

*Yes, MAX-lab, SOLEIL, ALS and Stanford*

**If yes what type of beamline(s):**

*Infrared and X-ray spectroscopy and X-ray adsorption*

**Specific experimental interest with respect to an infrared beamline:**

**(one or several)**

Chemical imaging (e.g. 350x350 µm2 focal plane array detector)

Nano-probe chemical imaging and spectroscopy

3D chemical imaging (10 µm spatial resolution)

Materials at extreme conditions:

High pressure (GPa)

Low temperatures (4.2 K)

High magnetic fields

High resolution spectroscopy (spectral resolution < 0.01 cm-1)

Chemical analysis (different fields e.g.)

Space Science

Medicine

Pharmaceutical sciences

Foresting and Wood

Cultural heritage and Art

Paleontology

Geology

Archeology

Materials

**Science Case (ca 1 page):**

Describe the experiments that you hope to do at the beamline. Focus on your field and the background, scientific motivation and challenges, less on the details and how the measurement and experiments are supposed to be made using infrared light. You may learn more about this at the workshop if you are somewhat prepared. Also if there are other beamlines at MAX IV that you consider using for the same/similar case please mention those as well. For instance IR is best suited for molecules and molecular material. It is less suited for e.g. metal content (even though there are exceptions). By combing e.g. X-ray absorption and IR for imaging a more complete understanding of a sample may be obtained, that is both chemical and elemental spatial distribution. Many of you can probably us old propsals as a basis to save time.