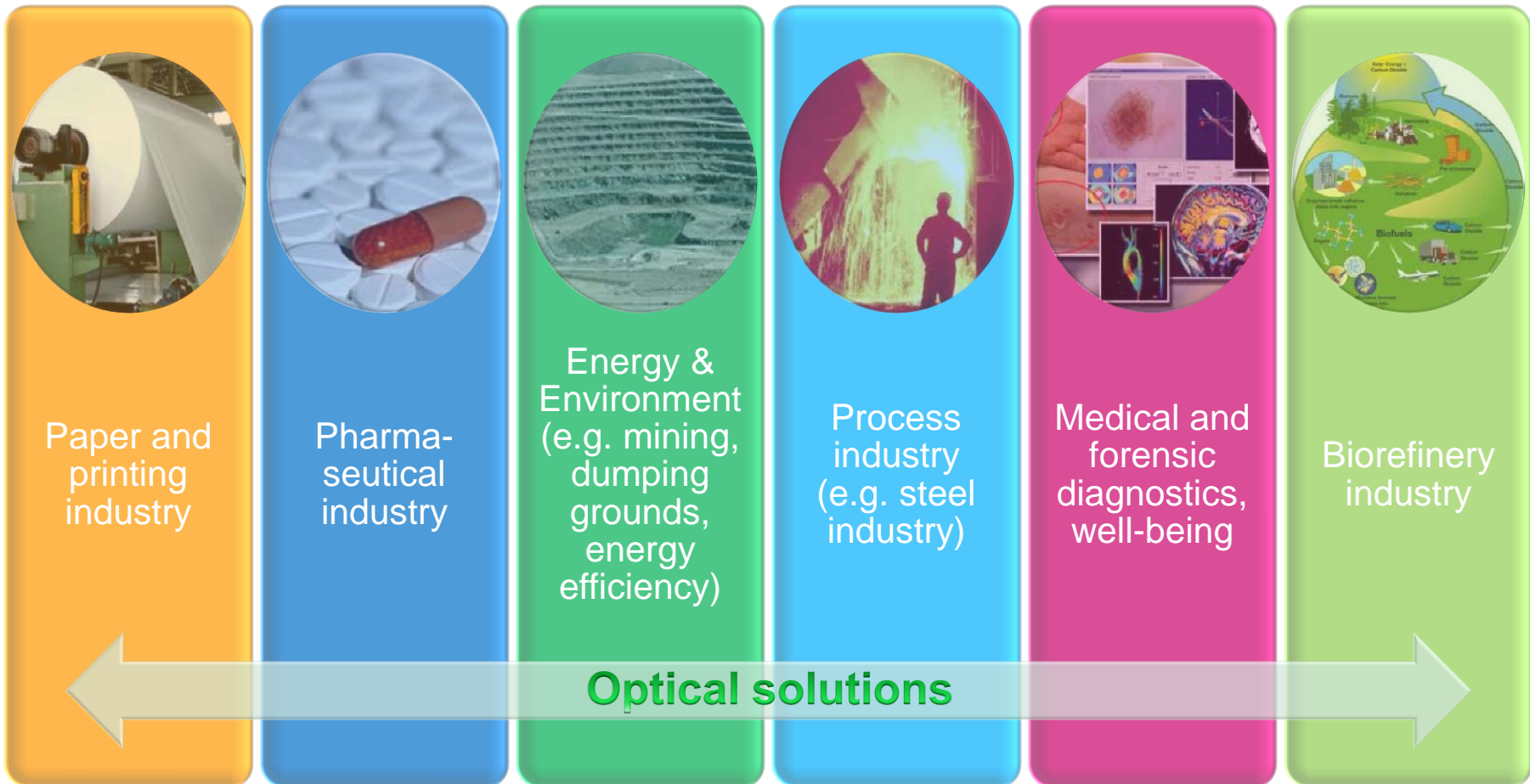




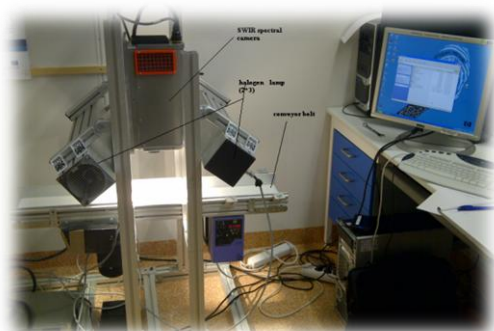
# Optical measurement technologies

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12.3.2014, GTK-Kuopio  
Kimmo Solehmainen, Research Team Leader  
VTT**

# Optical measurement technologies



# Optical measurement technologies



**Chemical imaging**



**Multipoint NIR spectroscopy**



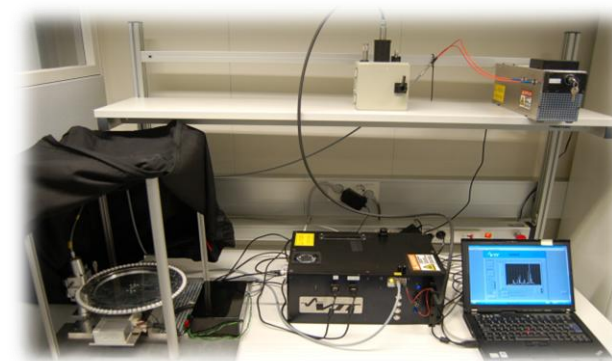
**Stand-alone LIBS system**



**Fabry-Perot intermerometer based hyperspectral imaging**



**Thermal imaging**



**Single-point and multipoint Raman spectroscopy**

# Stand-alone LIBS system for measuring small metal contents from mining water streams

System Main Cabinet

3G/GSM Antennae

Power supply cable

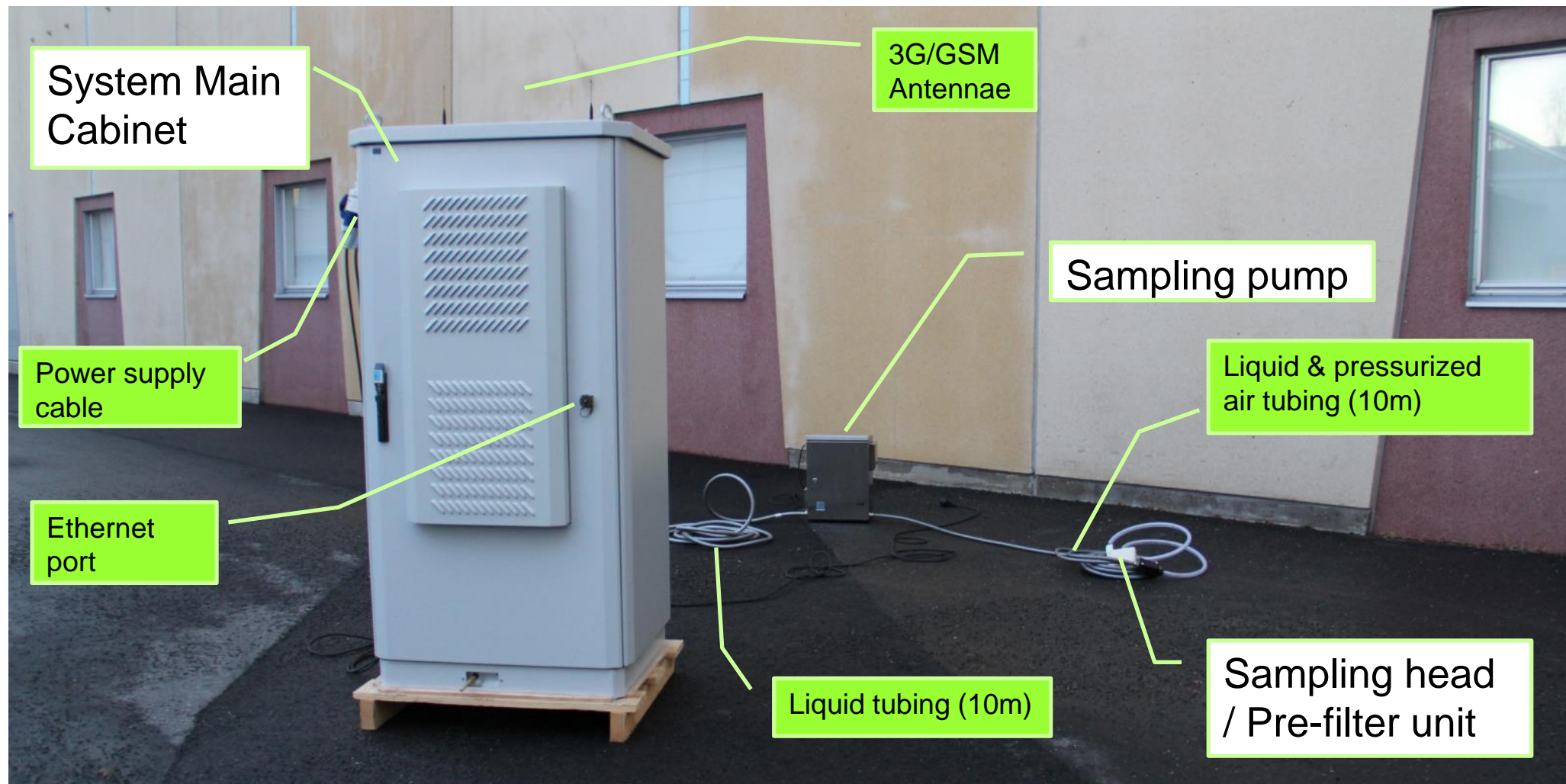
Sampling pump

Ethernet port

Liquid & pressurized air tubing (10m)

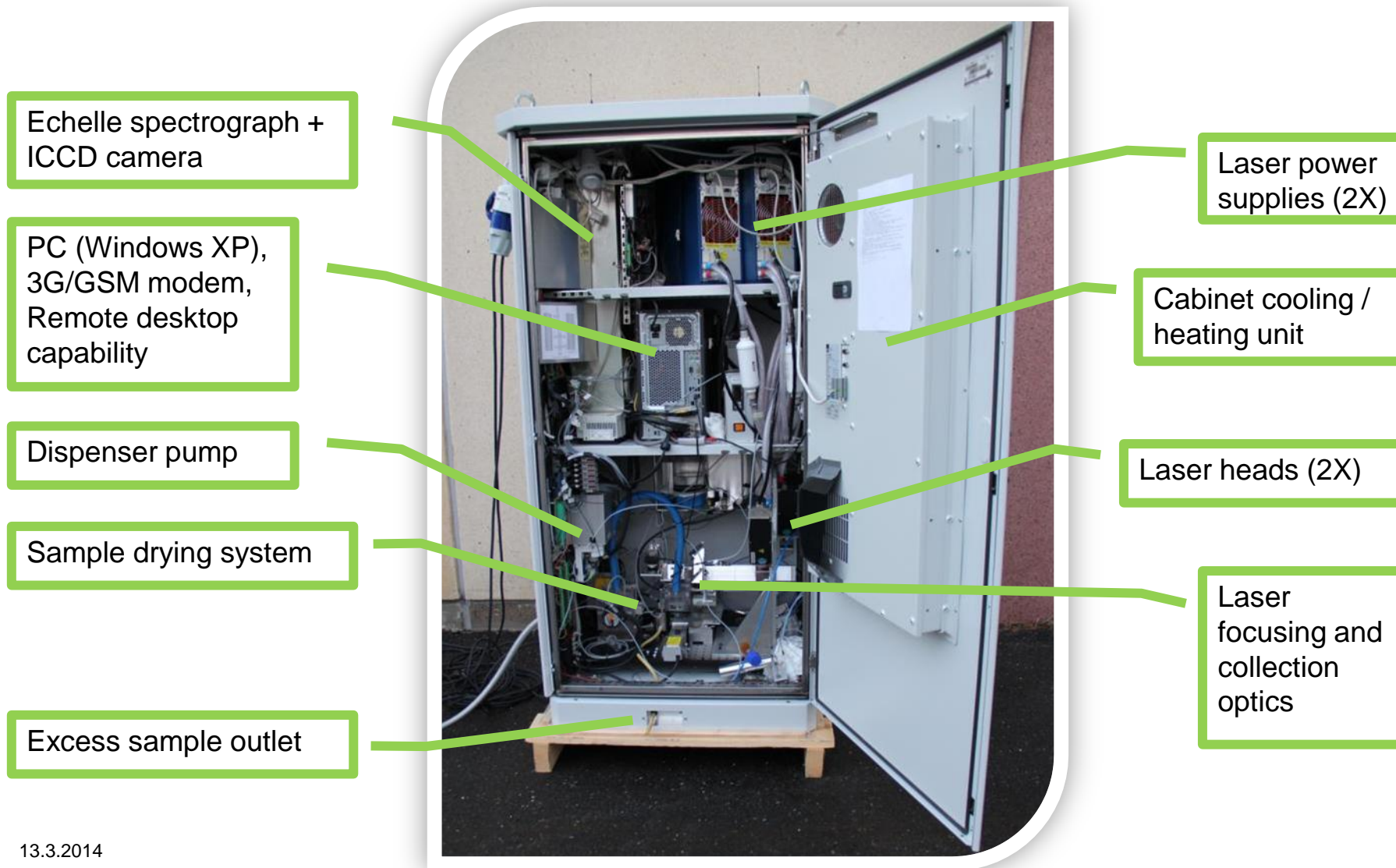
Liquid tubing (10m)

Sampling head / Pre-filter unit





# Stand-alone LIBS measurement system



Echelle spectrograph +  
ICCD camera

PC (Windows XP),  
3G/GSM modem,  
Remote desktop  
capability

Dispenser pump

Sample drying system

Excess sample outlet

Laser power  
supplies (2X)

Cabinet cooling /  
heating unit

Laser heads (2X)

Laser  
focusing and  
collection  
optics



# TEKNOLOGIASTA TULOSTA

