OPEN INNOVATION CONTEST 2019

Winterwind 2019 • Umeå • Feb 4-6

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INTERNATIONAL WIND ENERGY CONFERENCE

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RICHARD HANN

NTNU

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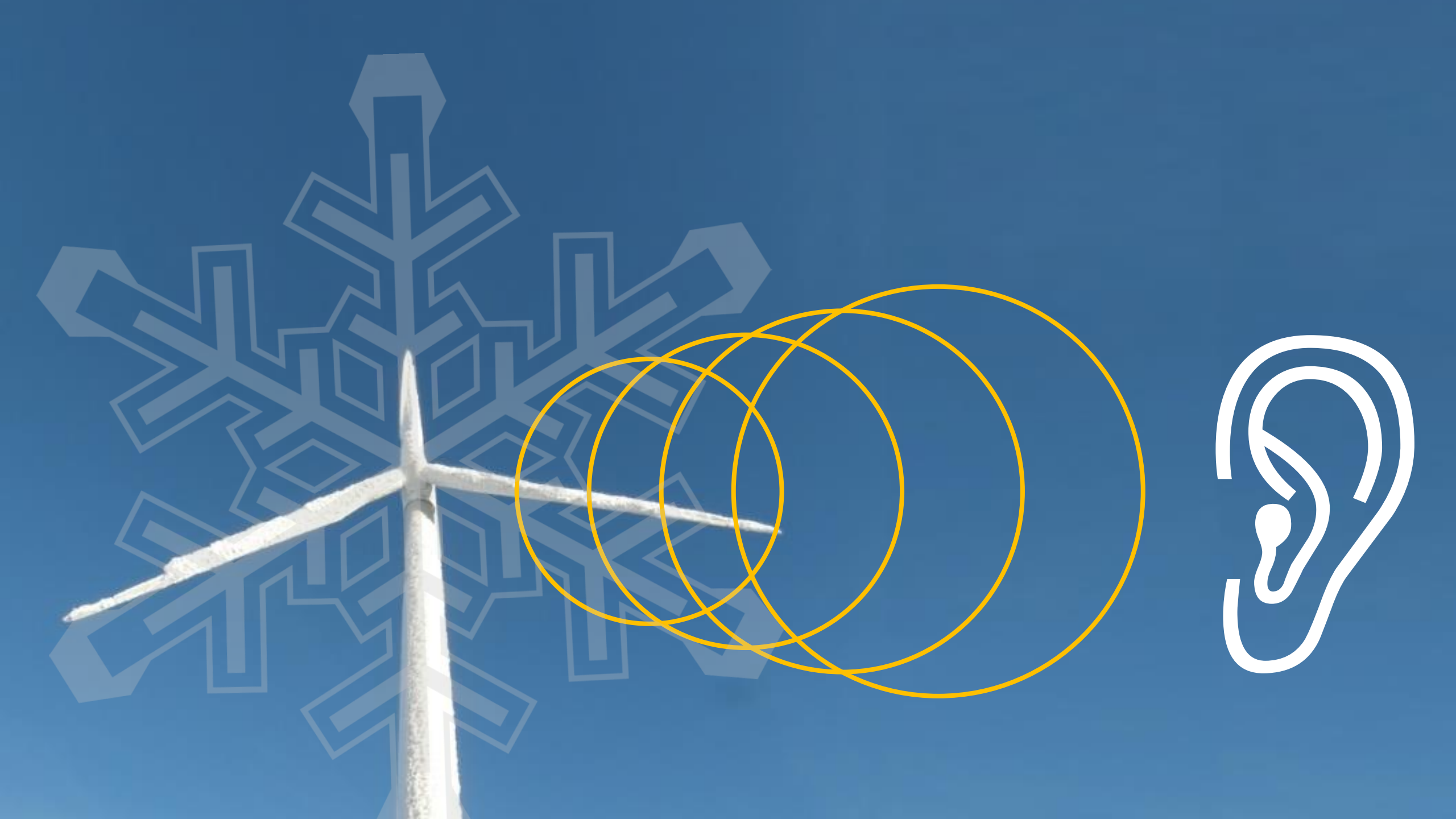
Noise may cause…

… annoyance

… psychological distress

… insomnia




Researchers
OEMs
Operators
Investors
Developers

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ANDRÉ BÉGIN-DROLET
UNIVERSITÉ LAVAL

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Meteorological Conditions Monitoring Station

Open Innovation Contest

André Bégin-Drolet, ing., Ph.D.

UNIVERSITÉ LAVAL

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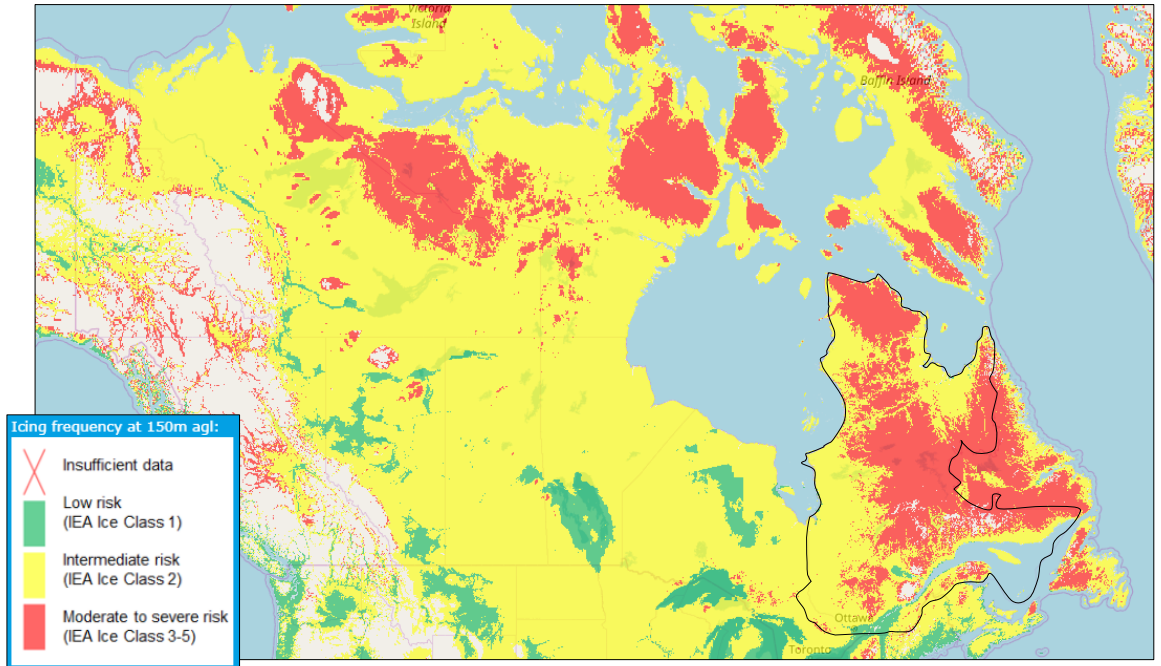
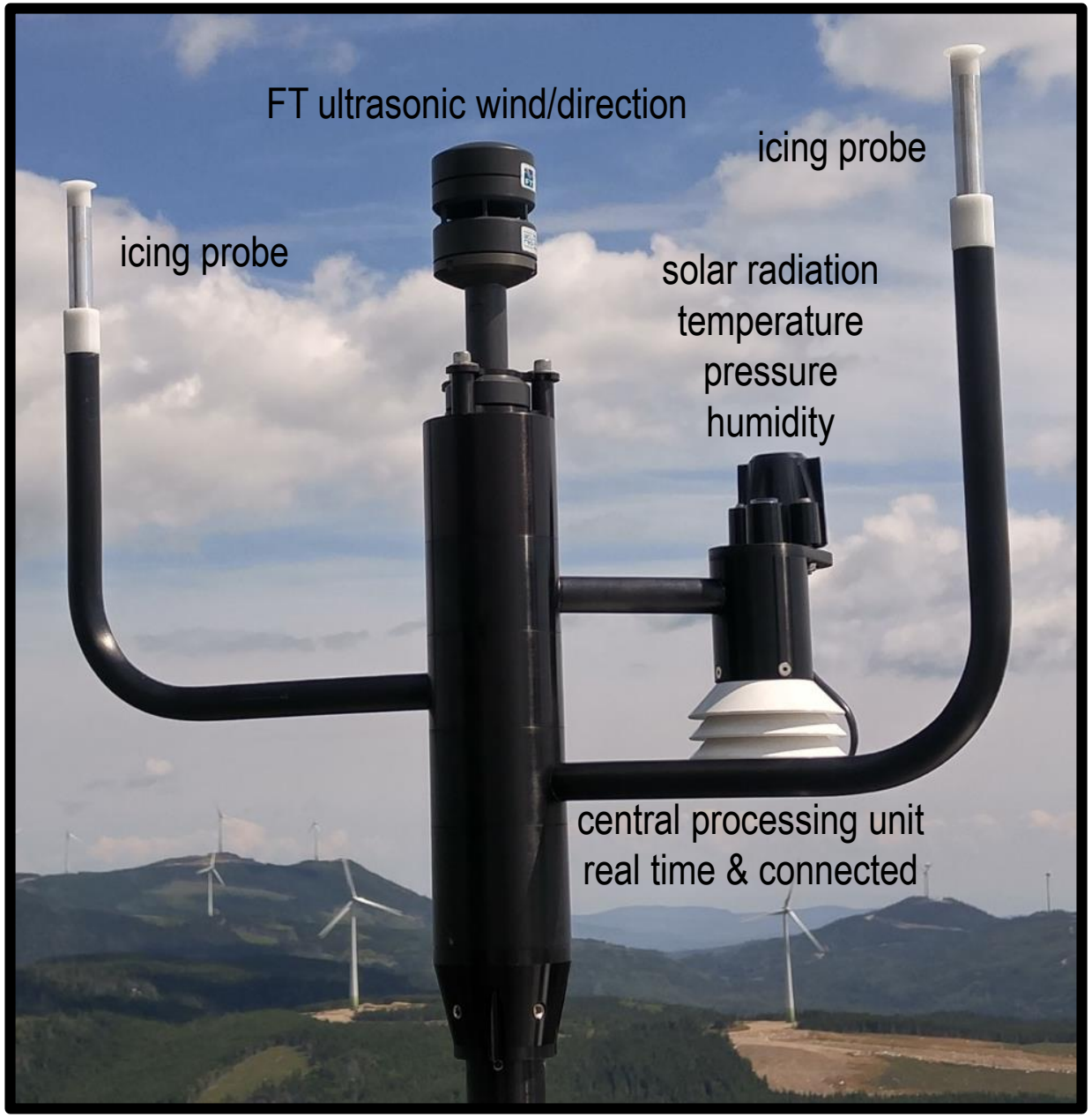
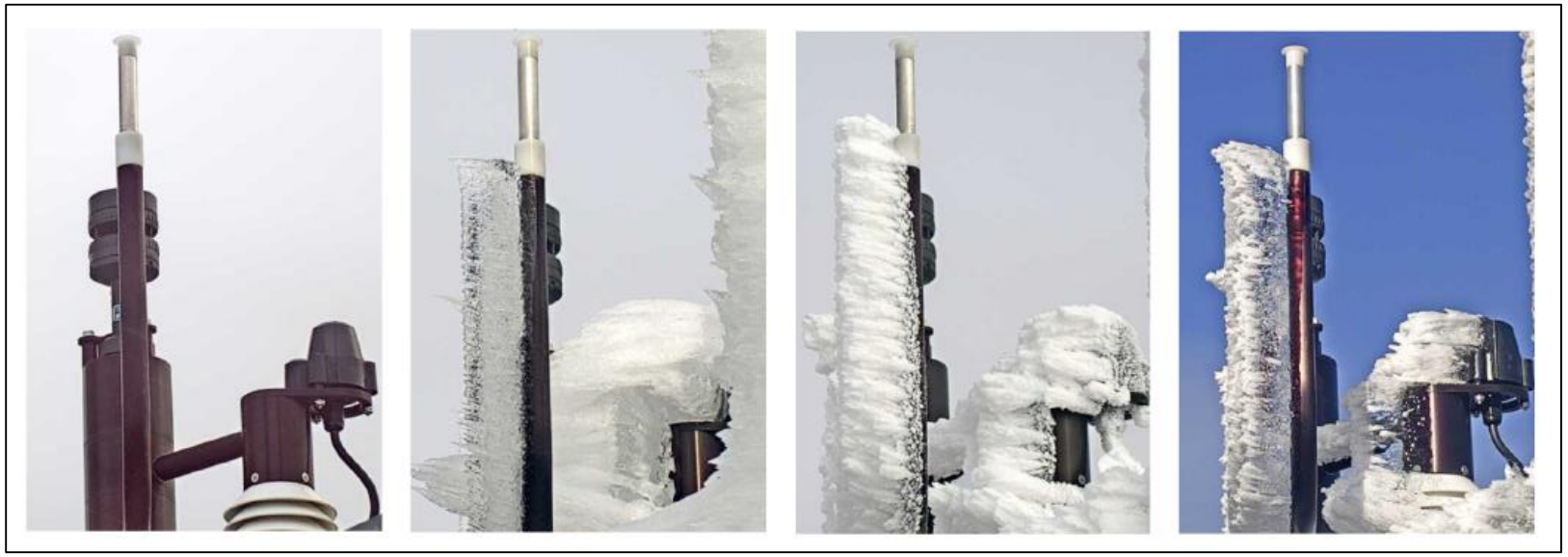
Umeå, February 4-6 2019



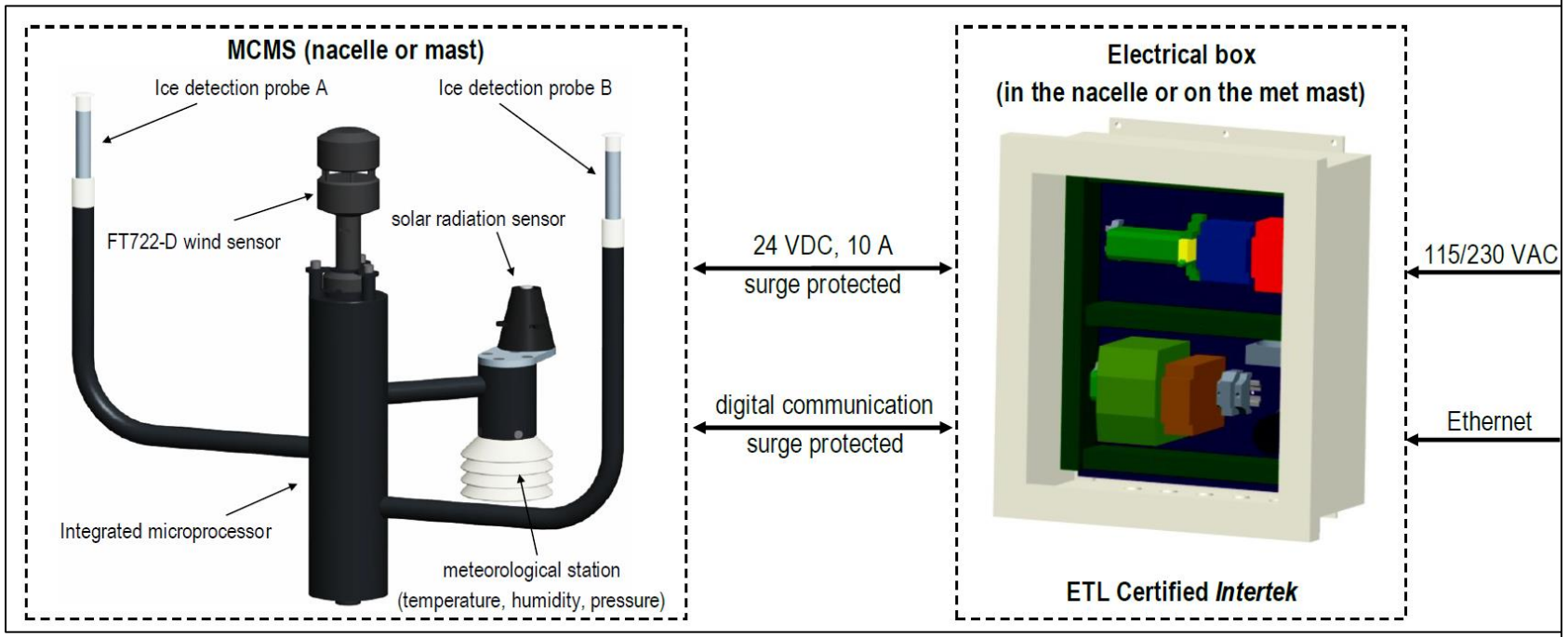
source: http://virtual.vtt.fi/virtual/wiceatla/

Meteorological Conditions Monitoring Station (MCMS)





More than a sensor!
Can also act as a PLC



Measurements		
Wind speed	0 to 50 m/s	± 0.5 m/s (0 to 15 m/s) ± 4 % (>15 m/s)
Wind direction	0 to 360°	± 4°
Temperature	-40 to 60 °C	± 0.1°C (-18°C to 30°C) ± 0.5°C (else)
Relative humidity	0 to 100 %	± 3 % RH
Barometric pressure	30 to 110 kPa	± 0.1 kPa
Solar radiation	0 to 1800 W/m²	± 5 %
Liquid water content[2]	Typ. 0 to 1 g/m³	
Icing severity[2]	Typ. 0 to 10 g/(sm²)	
Ice accumulation[2]	mm	
Icing type[2]	glaze, soft rime, hard rime	
Precipitation	on/off	
Meteorological icing	on/off	
Instrumental icing	on/off	

real time knowledge

trigger targeted actions
- blade heating, stopping, curtailment, ...
- dispatch of de-icing technologies
- risk of ice projections (H&S procedures)

long time knowledge

operational experience

improve AEP ($$$)

We are now seeking partners (wind turbine manufacturers, operators, developers) that have acknowledged the icing problem and that want to act upon it.

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MARTINS UMMERS
AERONES

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WTG BLADES MAINTENANCE DRONE

AERONES

WHY OUR DRONE IS SO INTERESTING

- Disruptive technology
- Financially attractive
- Timely attractive
- No need to risk peoples lives
- Brings possibility to apply surface treatment liquids (superhydrophobic nano coating), which lowers icing accreation by 60%.

OUR SOLUTION

Tethered heavy-lift drone

- 20x faster (1-4h)
- 5x cheaper
- Blade inspection included
- Works in temperatures below -10 degr.C
- Customers who care about:

  - performance of their WTG;

  - have icing challenges.

https://youtu.be/mP5LZYpFggM

AERONES

THANK YOU

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GSM EUROPE: +371 27889920

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PIETER JAN JORDAENS

OWI-LAB

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Laser Textured Wind Turbine Surfaces With Anti-Icing Properties

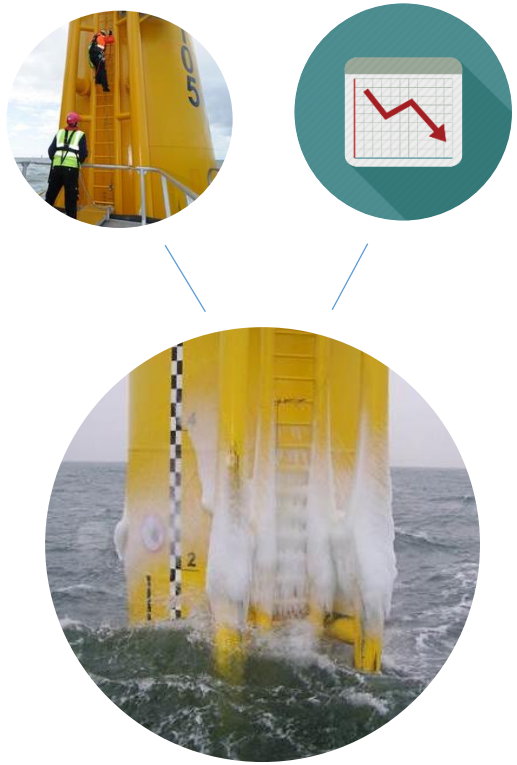
Pieterjan.jordaens@OWI-Lab.be| www.owi-lab.be | **Winterwind conference 2019**

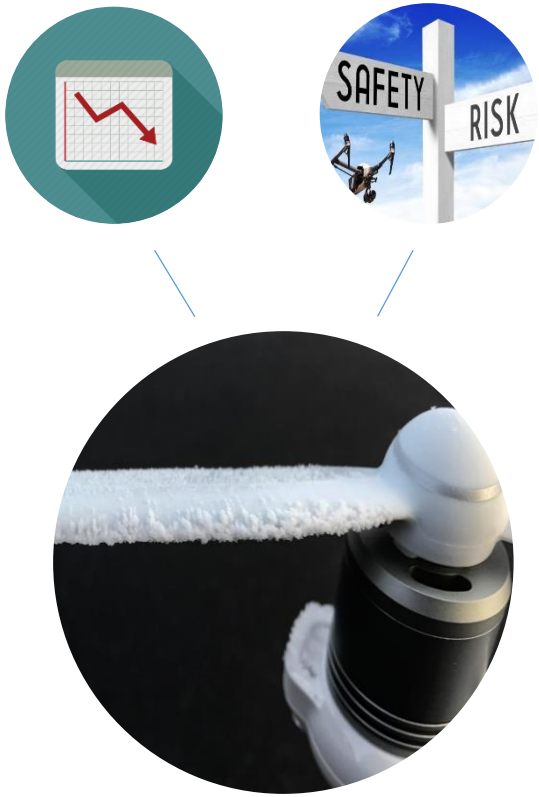
sirris
driving industry by technology

OWI lab

Industry DRIVERS for this topic:

- Production Losses
- Efficiency gains
- Safety & risk mitigation





Emergency lights, anemometers, cooling radiators, evacuation hatches

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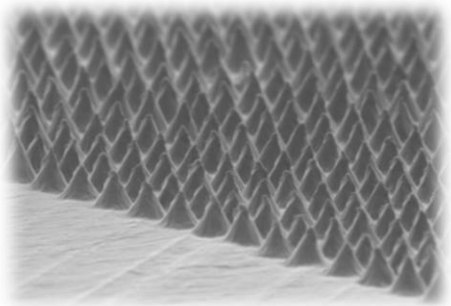
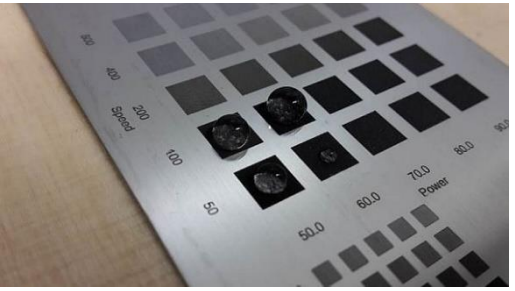
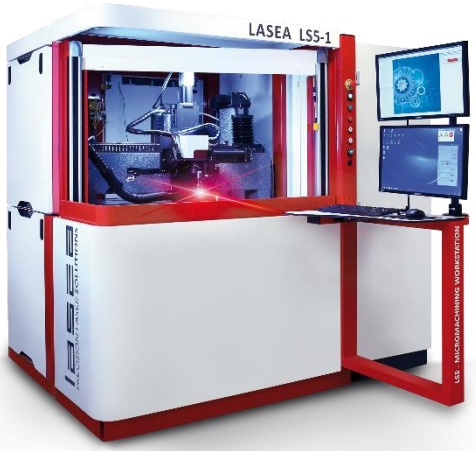
Inspiration: Hydrophobic Properties In Nature Are Awesome !

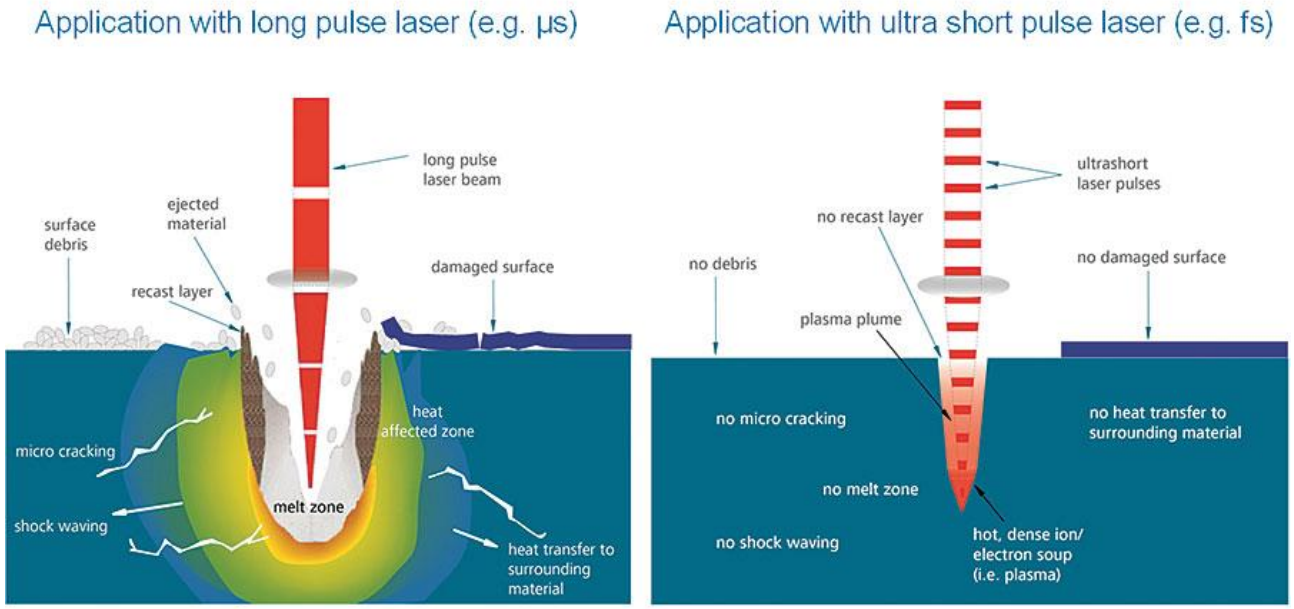




Femtosecond Pulsed Laser Technology As Enabling Technology To Manufacture Functional Surfaces (Metals / Polymers/ Coatings)



Laser textured surfacing, is an innovative manufacturing technique based on laser technology for creating simple or complex patterns on existing surfaces



Some interesting technology trends:

1. Uptake by other industries: watchmakers, aerospace, instrumentation
2. Proven technology on lab-scale for small equipment
3. Increasing production speed | Larger sizes
4. Increased digitization in photonic manufacturing
5. Potential of integration in other production steps

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1

Use-case 1:
Nacelle sensors
(small scale components)

2

Use-case 2:
Mid Sized Metal Coated Structures
(medium scale components)

3

Use-case 3:
Large Composite Coated Structures
(large scale components)

4

Spill-over use case:
Small Composite Structures
(small scale components)

- Investigation of type of materials & used coatings per relevant use cases + business intelligence
- Popular materials from wind energy applications will be laser-machined, and different surface textures will be tested & analyzed → Goal: to define optimal texture geometry by use case: micro-structured coatings on metals and polymers.
- The anti-ice properties of the surfaces will be tested in a climate chamber

Involvement of
the WIND ENERGY INDUSTRY
in use cases is key
(OEM's, suppliers)

Feasibility check

Vision: Automated Large Scale Laser Texturing

- Laser texturing machinery development
  - Faster machining
  - Increasing size

Fail Fast
Fail Cheap
Fail Forward

Two separate 4Y EU R&D projects need to be set-up:

- Application based → Wind industry driven
- Machinery based → Machine builder driven

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pieterjan.jordaens@owi-lab.be | www.sirris.be | www.owi-lab.be

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CHARLES GODREAU
NERGICA

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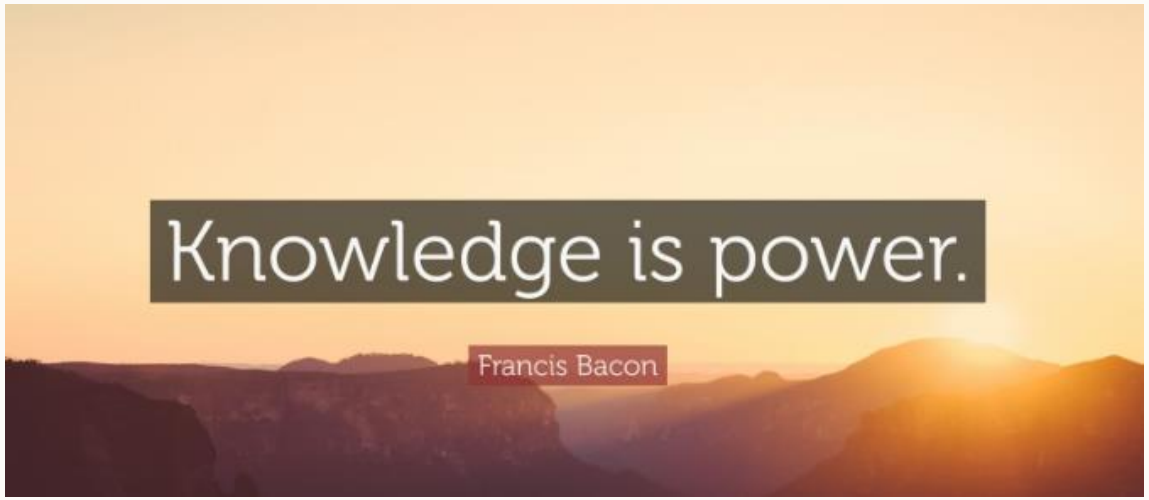
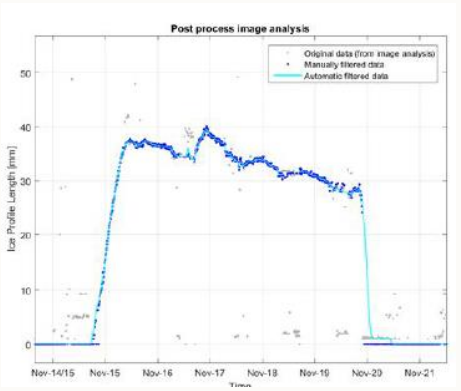
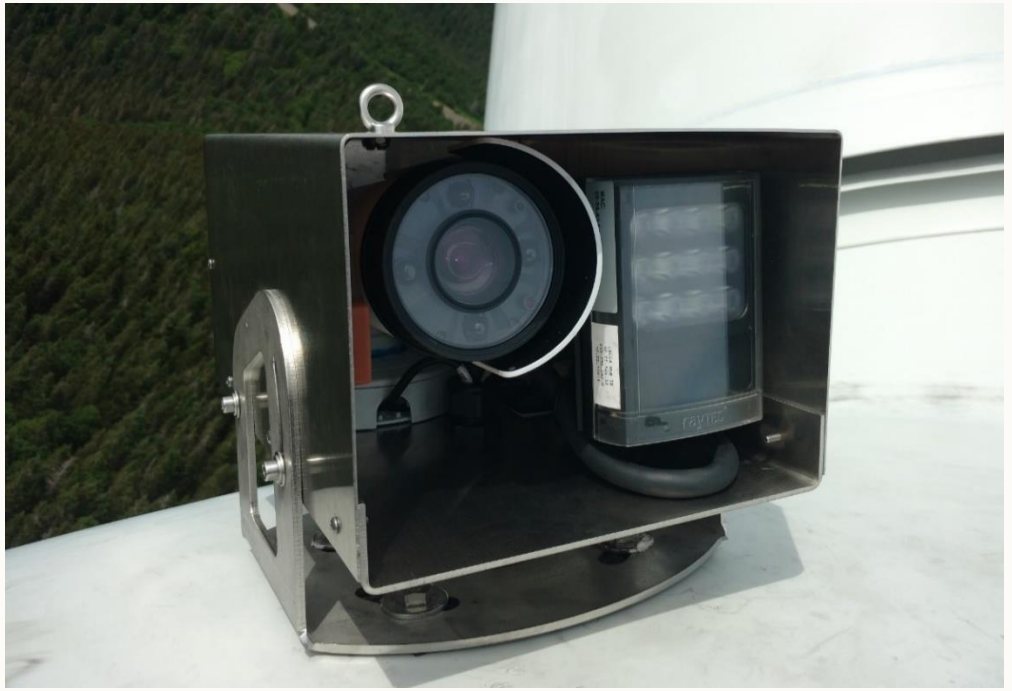


Path to Success





Quality
Reliability
Adaptability

Ready for Market

share	explore	beyond

NERGICA

a skilled and creative partner!

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MENTI.COM

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- Quality of presentation
- Solves a real & clear problem
- Novelty or uniqueness
- Impact for the industry
- Feasibility
- Steps remaining well identified

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AWARD

5:30 pm

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