Wood and Bionanocomposites

Our research

Kristiina Oksman

Chair Professor in wood and bionanocomposites

LULEÅ UNIVERSITY OF TECHNOLOGY

Fact about LTU
17 670 students
1 840 staff

LULEÅ TEKNISKA UNIVERSITET

Little about us

- Kristiina Oksman
- Chair Professor in Wood and Bionanocomposites at LTU, 2006-
- Status professor in Mechanical and Industrial Engineering at University of Toronto, Canada 2019-
- Editor for Composites part A, 2015-
- Worked with development of composite materials and their processing for the last 30 years

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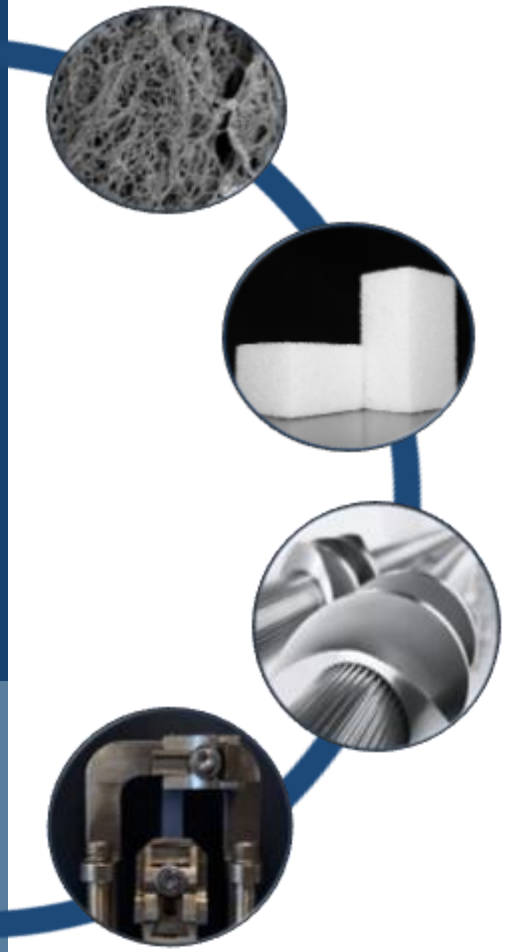
Group

- Mohini Sain adjunct professor, University of Toronto, Canada
- Alexander Bismarck WISE guest professor, University of Vienna, Austria
- Linn Berglund university lector
- 4 Postdocs
- 4 PhD students
- Project and master students



Our research activities

Preparation of nanomaterials with different functionalities

- Mechanical & chemical separation from biomass
- Biocarbon

Manufacturing process of bio- and nanocomposites

- Composite processes, extrusion
- Foams, aerogels, hydrogels

Relation between process, properties and structure

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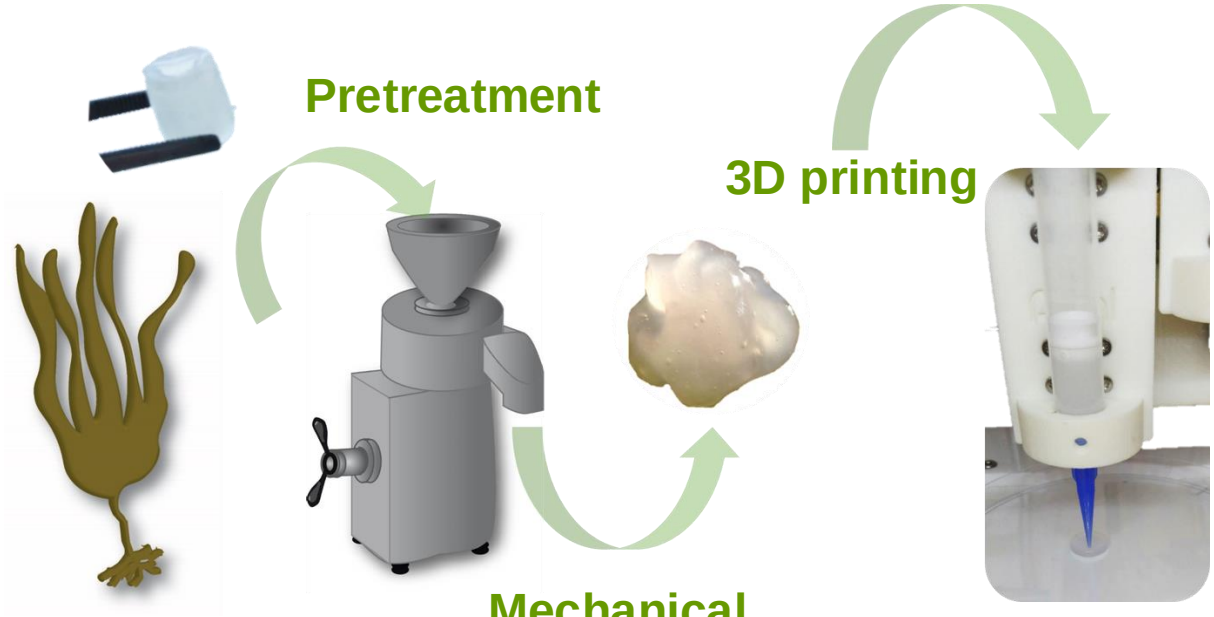
From seaweed to nanofiber hydrogels and aerogels



Berglund et al., ACS Appl. Bio Mater. 2020, 3

Patent sold to Alginor AS

SFF HEALiX: Advanced wound dressing materials non healing wounds

PhD student Yagmur Bas

Linköping, Örebro, LTU, S2M

- Non-healing wounds are painful and costly for society
- We are developing nanocellulose hydrogels from wood particles with the aim to replace advanced bacterial cellulose hydrogels which are used today as dressings

SUSEN Sustainable electronics from Northern bioresources Postdoc Mandeep Singh

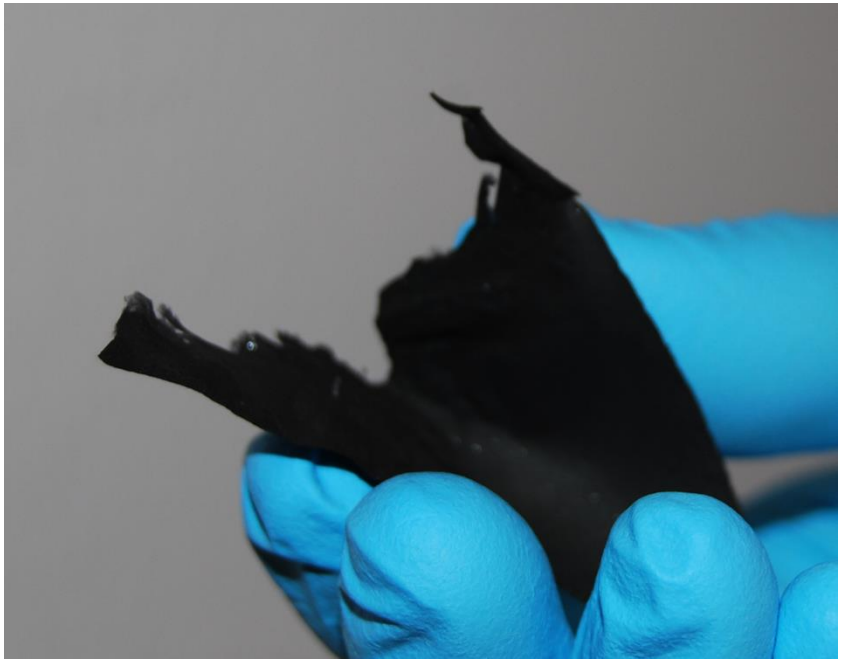
Interreg Aurora

Co-funded by the European Union

Oulu University and LTU

NOKIA, Tactotek, Brightplus, ETC RISE

- Preparing carbon materials from renewable resources, from Northern part of Finland and Sweden
- Carbonization of electrospun lignin fibers, fine particles and foams
- Developing carbon with different functionalities
- Invisible/EMI shielding surfaces, antenna device, mining sensors, wearable electronics



Wallenberg Initiative Materials Science for Sustainability

Sustainable carbon composite electrodes for energy storage

Postdoctoral fellow:

Mehrdad Mashkour

Supervisors:

Kristiina Oksman & Alex Bismarck

PARTICIPATING UNIVERSITIES

CHALMERS UNIVERSITY OF TECHNOLOGY

KTH VETENSKAP OCH KONST

LINKÖPING UNIVERSITY

LULEÅ UNIVERSITY OF TECHNOLOGY

LUND UNIVERSITY

Stockholm University

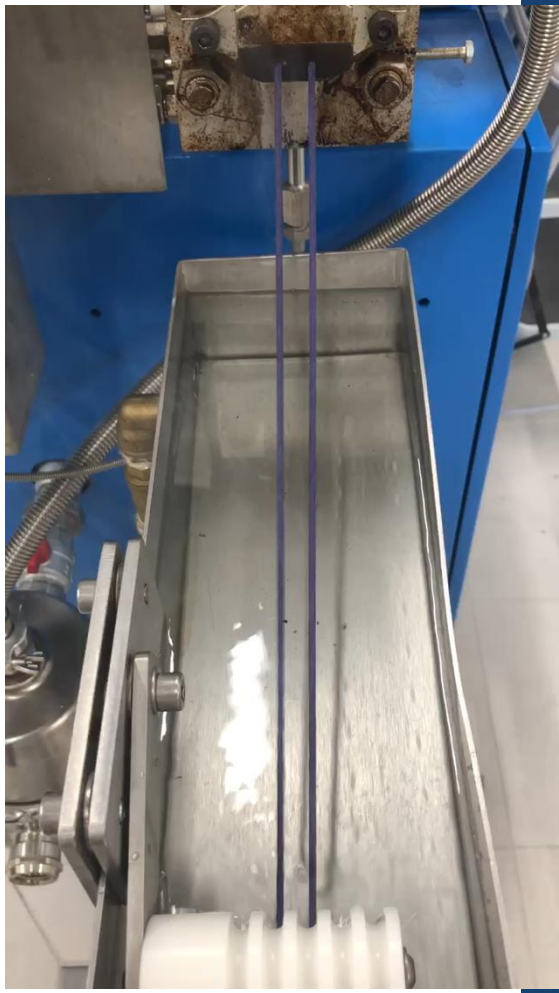
UPPSALA UNIVERSITET

FUNDED BY

Knut and Alice Wallenberg Foundation

Recycling

PhD student Luisa Völtz



Rosenstock Völtz, L., Berglund, L., & Oksman, K.. Composites Part A, 175 (2023)

Sustainable structural biocomposites and their structure-property relations

Postdoc Agumba Dickens

Can we create high-performance and sustainable biocomposites of cellulose filaments?

Develop a composite process which is leading to well aligned filaments

WWSC
WALLENBERG WOOD SCIENCE CENTER

Knut and Alice Wallenberg Foundation

Spinnova
The Sustainable Fibre Company.

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