

| BIOECONOMY RELATED RESEARCH AT UEF ACCORDING TO THE BIOECONOMY CLASSIFICATION OF EU | | | | |
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| Subject | Department | Subject studied | Contact person | Web site |
| Chemical industry | SIBLabs | Processing technology of bio-based materials | | |
| | | Material and molecular knowledge for added value: investments to biorefineries, raw material from biomass, nutrients from charcoal | | |
| | Department of Physics and Mathematics | Enabling SERS and TLC simultaneously | Matthieu Roussey | http://www.biosee.fi/ |
| | | Surface spectroscopy | Matthieu Roussey | |
| | Institute of Public Health and Clinical Nutrition | Material and molecular knowledge for added value: raw material from biomass | Jouko Vepsäläinen | |
| | Applied Physics | BioShield - enhanced plant protection and growth with biodistillates | Reijo Lappalainen | |
| Construction | | | | |
| Food industry | Department of Physics and Mathematics | Detection of Sudan dyes III and IV in palm oils from Ghana | Matthieu Roussey, Sampson Andoh, Kai Peiponen | https://www.uef.fi/en/web/photronics/integrated-optics |
| | School of Applied Educational | Bioeconomy and sustainable food | Anna-Liisa Elorinne | |

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| | Science and Teacher Education | | | |
| | | Insect consumption attitudes among vegans, non-vegan vegetarians and omnivores | Anna-Liisa Elorinne | |
| | Department of Social Science | Animal welfare | Elisa Aaltola, Eeva Jokinen | http://www.uef.fi/web/bodi/elisa-aaltola |
| | Institute of Public Health and Clinical Nutrition | Sustainable and economical insect production chains | Jenni Korhonen | |
| | | Food sector business and added value | Marjukka Kolehmainen | https://www.ruokalaakso.fi/eng/ |
| Forestry | School of Computing | Wood Volume and Mass Flow Measurement, color machine vision-based solution | | |
| | | Paper on-line roughness measurement of paper, Products for on-line and off-line measurement of paper roughness | | |
| | | Computational methods for spectral data and image analysis | | https://www.uef.fi/web/spectral/research |

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| | Department of Environmental and Biological Sciences | Effects of ditch management on water quality | Jukka Pumpanen / Frank Berninger | |
| | School of Forest Sciences | Forest bioeconomy foresight | Teppo Hujala | http://www.uef.fi/en/web/biotalous |
| | | Forest bioeconomy | Jyrki Kangas / Sari Pitkänen | https://www.uef.fi/en/web/biotalous |
| | | Patterns of biodiversity and the dynamics of the boreal forest ecosystems | Jari Kouki, Matti Koivula | http://www.uef.fi/en/web/forest/forest-ecology |
| | | Wood science focuses on timber and various effects affecting the quality of the physical and anatomical qualities of wood | Petri Kärenlampi, Katri Luostarinen | http://www.uef.fi/en/web/forest/wood-science-wood-technology-and-wood-materials-science |
| | | Forest mensuration science focuses on forest inventories utilizing remotely sensed materials such as LiDAR data, satellite images, and aerial images. | Matti Maltamo, Lauri Korhonen | http://www.uef.fi/en/web/forest/forest-mensuration-and-planning |
| | | Forest Technology focuses on forest work, wood procurement, and production processes for renewable | Teijo Palander, Jukka Malinen | http://www.uef.fi/en/web/forest/forest-technology-and-energy-technology |

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| | | materials. The integration of wood and bioenergy harvesting has been a recent focus. | | |
| | | Forest health; forest protection: impacts of forest disturbances to forest microbiota and forest animals; game-oriented forest management; climate change impacts to forest and wood health quality and forest carbon storage; wood and non-wood forest products as well as ecosystem services. | Ari Pappinen | http://www.uef.fi/en/web/forest/forest-health |
| | | Silviculture and forest management focus are on dynamics and sustainable management of boreal forest ecosystems under changing climatic conditions, with implications on the production of forest biomass (timber, energy biomass), | Heli Peltola, Antti Kilpeläinen | http://www.uef.fi/en/web/forest/forest-management-and-ecosystem-services |

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| | | carbon sequestration, and risk management of forests (e.g. wind/snow extremes and drought). | | |
| | | Forest management planning analyses alternative forest management options using forest inventory data and models developed by forest research. A central task of planning is to predict the consequences of management alternatives, so that treatments that best fulfil the objectives of forest owners and other stakeholders are applied. | Timo Pukkala, Tero Heinonen | http://www.uef.fi/en/web/forest/forest-mensuration-and-planning |
| | | Forest economy and policy: economic production and consumption of forest-related services and goods, regulation that have been adopted and | Jouni Pykäläinen, Jukka Tikkanen | http://www.uef.fi/en/web/forest/forest-economy-and-politics |

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| | | pursued by governments and other organizations, multiple-uses of forests and the practice of forestry in Russia | | |
| | | Forest information systems analyses alternative forest management options using forest inventory data and models developed by forest research. A central task of planning is to predict the consequences of management alternatives, so that treatments that best fulfil the objectives of forest owners and other stakeholders are applied. | Timo Tokola | http://www.uef.fi/en/web/forest/forest-mensuration-and-planning |
| | | In soil science and peatland ecology the future forest economists are given a good foundation in multi-objective forest planning, the ability to do economic and social | Eeva-Stina Tuittila, Tarja Lehto | http://www.uef.fi/en/web/forest/forest-ecology |

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| | | analysis of the forestry sector and understanding of the different forms of use for forests. | | |
| | | Wood material science: e.g. wood characteristics, modification and preservation, biopolymer chemistry, biorefining | Ossi Turunen, Antti Haapala | http://www.uef.fi/en/web/forest/research |
| | | Process-based modelling of terrestrial ecosystem functioning | Ari Lauren | http://www.uef.fi/en/web/forest/research |
| | | Forest biomasses and bioenergy focuses on forest work, wood procurement, and production processes for renewable materials. The integration of wood and bioenergy harvesting has been a recent focus. | Blas Mola | http://www.uef.fi/en/web/forest/forest-technology-and-energy-technology |

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| | | <p>Optimization of multiple-use forest management analyses alternative forest management options using forest inventory data and models developed by forest research. A central task of planning is to predict the consequences of management alternatives, so that treatments that best fulfil the objectives of forest owners and other stakeholders are applied.</p> | Petteri Packalen | http://www.uef.fi/en/web/forest/forest-mensuration-and-planning |
| | | <p>Forest pathology, zoology: impacts of forest disturbances, forest microbiota and animals and climate change impacts to forest yield, productivity and quality of wood and non-wood products as well as ecosystem services</p> | Olli-Pekka Tikkanen | http://www.uef.fi/en/web/forest/forest-health |
| | | <p>Remote sensing</p> | Mikko Vastaranta | http://www.uef.fi/en/web/forest/research |
| | | <p>Forest management, biomass conversion, sustainability</p> | Heli Peltola | https://www.uef.fi/web/forbio |

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| | | assesment, politics, FORBIO | | |
| | Department of Chemistry | Forest management, biomass conversion, sustainability assesment, politics, FORBIO | Janne Jänis | https://www.uef.fi/web/forbio |
| | Department of Geographical and Historical Studies | Green gold to east: Chinese investing to the Finnish bioeconomy | Lasse Väänänen | |
| Hunting | | | | |
| Nature turism, green care and recreation | Business School | ProWell – towards a new understanding of rural wellbeing tourism | Tuohino Anja | |
| | | Finrelax - Finnish Countryside as a setting from Fural Wellbeing Tourism Development | Tuohino Anja | |
| | | Homes beyond homes (HOBO) - multiple dwellinang and everyday living in leisure spaces | Hall, Michael C. | |
| | | Well-O-Live - Wellness and wellbeing experience across the European Routes of the Olive Tree | Konu Henna | |

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| | | Virkein - New business opportunities in sustainable nature tourism and recreation - Literature Review | Konu Henna | |
| | | Virtual Outdoors Finland | Pasanen Katja | |
| | | Towards responsible tourism | Pasanen Katja | |
| Pharmaceutical industry | School of Pharmacy | Research of polyamines | Leena Alhonen | |
| | Department of Environmental and Biological Sciences | Combustion emissions, their atmospheric transformation and engineered nanoparticles | | |
| | SIBLabs | Sensors, technology | | |
| | | Processing technology of bio-based materials | | |
| | | Material and molecular knowledge for added value | | |
| | Department of Physics and Mathematics | Functional surfaces for packages, their fabrication with the laser ablation and their replication into the cardboard material. | Pasi Vahimaa | |

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| | Department of Geographical and Historical Studies | Multidimensional change dynamics of the Finnish forest industry 1996-2018 | Jakob Donner-Amnell | |
| | School of Pharmacy | Material and molecular knowledge for added value | | |
| | Institute of Public Health and Clinical Nutrition | Material and molecular knowledge for added value | Reijo Lappalainen | |
| Renewable energy | Department of Environmental and Biological Sciences | Cleantech applications at the assessment of best practices for emission abatement strategies | | |
| | | Use of biochar for Carbon sequestration including analysis of energy production systems | Jukka Pumpanen / Frank Berninger | |
| | SIBLabs | Processing technology of bio-based materials | | |
| | Department of Geographical and Historical Studies | Administration and management of bioenergy in North-Karelia | Jani Lukkarinen | |
| | School of Pharmacy | Processing technology of bio-based materials | Olavi Raatikainen | |

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| | School of Forest Sciences | Processing technology of bio-based materials, growth and yield potential, biomass properties and growth risks | Antti Haapala, Blas Mola | |
| | Department of Applied physics | Novel sensor techniques for bioeconomy | Laura Tomppo | |
| Sufficiency of natural resources | Department of Environmental and Biological Sciences | Acclimation mechanisms of plants and animals (insects in particular) to environmental change | Sari Kontunen-Soppela, Elina Oksanen, Markku Keinänen | https://www.uef.fi/en/web/aquatic-ecology |
| | | Multitrophic communication, gas dynamics in northern ecosystems and underlying biogeochemical and microbial processes | | |
| | | Bioactive compounds of plants, and improved resistance and plant quality | | |
| | | Radioecological and ecotoxicological research on behavior of contaminants in the environment and their effects on wildlife species and ecosystems | Jarkko Akkanen | https://www.uef.fi/en/web/ecotox |

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| | | Effects of forestry drainage on catchment hydrology and wetland ecosystems | Teemu Tahvanainen | |
| | | Edible insect production and industrial side-product feeds | Heikki Roininen / Anu Valtonen | |
| | SIBLabs | Biodiversity and digitalisation | | |
| | Department of Chemistry | Biofuels and biobased chemicals, thermochemical conversion, analytical method development | Janne Jänis | https://www.uef.fi/en/web/kemia/bio-organic-chemistry |
| | Business School | Catalyzers for circular economy: from innovation ecosystems to business ecosystems | Lehtimäki Hanna | |
| | Law school | Environmental Impact Assessment Law in Transition | Ismo Pölönen | |
| | Department of Geographical and Historical Studies | Wasteless Karelia | | |
| | | Translocal forest owners and environmental collaboration: An action learning process of forest | | |

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| | | governance transformation in Tanzania | | |
| | | Sustainable Management of Natural Resources in Mozambique | | |
| | Department of Social Science | Sustainable lifestyle; considered choices and happiness | Arto O. Salonen, Eeva Jokinen | https://artosalonen.com/julkaisut |
| | School of Pharmacy | Material and molecular knowledge for added value | Jouko Vepsäläinen, Reijo Lappalainen | |
| | | Investment to CPC instrument | Jouko Vepsäläinen | |
| | | Polyamines and climate change | Jouko Vepsäläinen | |
| | | Investment to NMR instrument | Jouko Vepsäläinen | |
| | | Networking in material technology | Arto Koistinen | |
| | | Novel methods to collect scandium from challenging ore | Jouko Vepsäläinen | |
| | | Investment to XRF instrument | Jouko Vepsäläinen | |
| | | Study hybrid materials as water purification agents | Vesa-Pekka Lehto | |
| | | CIAM Customer-driven innovations in | Tuomo Keinänen | |

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| | | analysis of microplastics | | |
| | Department of Applied physics | Männyn arvon maksimaalinen hyödyntäminen rungon tyven kuvatulkinnan ja NDT-mittauksen avulla | Laura Tomppo | |
| Transportation of biobased raw materials and products | | | | |
| Water purification and distribution | SIBLabs | Water purification usign side-streams | | |
| | | Microplastics in water ecosystems | | |
| | School of Pharmacy | Remove uranium from waste waters | Jouko Vepsäläinen | |
| | | Remove sulfur from waste waters | Jouko Vepsäläinen | |
| | | Networking for water knowhow | Jouko Vepsäläinen | |
| | | Intake of REE element from water flows | Jouko Vepsäläinen | |
| Wood products industry | Department of Environmental and Biological Sciences | Non-invasive optical monitoring of wood and biomaterials | Markku Keinänen | https://www.uef.fi/en/web/spectromics |
| | Department of Chemistry | Cellulose, hemicellulose & | Juha Rouvinen, Nina Hakulinen | http://www.oppi.uef.fi/wanda/kemia/research/protein/ |

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| | | lignin degrading enzymes | | |
| | Wood Materials Science | Development of new sustainable pathways and tools for biomass conversion to new materials, fibers, biobased fuels and chemicals and other new sustainable biobased solutions. Devices and technologies for ex. HTL, chemical fractionation, enzymatic modification and conversion, Aspen and sima pro softwares; Industrial biotechnology based on utilising fungal biodiversity and genomics, including enzymes | Antti Haapala, Ari Pappinen, Ossi Turunen | |
| | Department of Applied physics | B | Laura Tomppo | |
| Other | Department of Environmental and Biological Sciences | Aquatic ecology, Aquaculture | Raine Kortet / Anssi Vainikka | https://www.uef.fi/en/web/aquatic-ecology |
| | | Lake ecosystems | Paula Kankaala | https://www.uef.fi/en/web/aquatic-ecology |

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| | | Biochar for Remediation of contaminated soils | Frank Berninger / Jukka Pumpanen | |
| | School of Forest Sciences | ALL-YOUTH: All youth want to rule their world, making bioeconomy as a possibility | Teppo Hujala | www.allyouthstn.fi |
| | | Bioeconomy education | Jukka Tikkanen, Sari Pitkänen, Antti Haapala | https://www.wur.nl/en/project/ABBEE.htm ; |
| | Business School / School of Forest Sciences | Business Models of Born Globals in a Forest-Based Bioeconomy | Mika Gabrielsson | |
| | | Business from solutions for waste sorting | Helen Reijonen | |
| | Law school | Collaborative remedies for fragmented societies - Facilitating the collaborative turn in environmental decision-making | Ismo Pölönen | |
| | School of Applied Educational Science and Teacher Education | Innovative learning environments: Forest bioeconomy path for high schools (2018-2020) | Petteri Vanninen, Sinikka Pöllänen | |
| | | CBC 2014-2020 program: Digital Forest Pedagogy – DigiFor (2018-2020). | Petteri Vanninen, Sinikka Pöllänen | |

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| | | Connecting the research forests of Luke into bioeconomy education | Petteri Vanninen | |
| | | Developing sustainable handicraft using biobased materials; purchase, management and circulation | Sinikka Pöllänen | |
| | Department of Geographical and Historical Studies | Spatialities of Local Transformations (SLOT) –research group | Jarmo Kortelainen, research group: Moritz Albrecht, Olli Lehtonen, Jani Lukkarinen, Lasse Väänänen, Gleb Iarovoi | |
| | | Sustainability governance of BioAssemblages; A trifold perspective on bioeconomy clusters in the making | Moritz Albrecht | http://www.uef.fi/documents/371347/1445910/Albrecht.pdf/a0937f56-733c-4fa3-8787-a1329b99c511 |
| | | Place-based development and local capacity potentials | Olli Lehtonen | |

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| | | ALL-YOUTH: All youth want to rule their world, making bioeconomy as a possibility | Irmeli Mustalahti, Denis Dobrynin Antti Erkkilä, Nina Tokola Pasi Huttunen, Violeta Gutiérrez Zamora, Maija Hyle, Bishnu Devkota, Rijal Ramdani, Mariaselvam Geethanjali, Estevao Eduardo Chambule, Aristarik Hubert Maro, Pamela White | www.allyouthstn.fi |
| | | How can the development of bioeconomy in Finland impact forest governance in Russia? | | |
| | | Environmental collaboration and conflict resolution | | |
| | | Strengthening the foundation for technological green growth innovation policy | Tuula Teräväinen, Jakob Donner-Amnell ja Rauno Sairinen | http://nordicinnovation.org/projects/the-nordic-green-growth-research-and-innovation-programme/new-nordic-ways-to-green-growth-nowagg/ |
| | Department of Social Science | Bioinformation research of biocapitalism, human biology and species-specific abilities | Ilpo Helen | https://www.researchgate.net/project/Goods-for-Health-Personalized-health-services-and-flexible-appropriation-of-bioinformation-GoHe |
| | | Application of lean production model | | www.lewoge.fi |

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| | | and its effects in public social and healthcare work | | |
| | | Animal and climate related philosophical research | Markku Oksanen, Eeva Jokinen | https://uefconnect.uef.fi/henkilo/markku.oksanen/ |