Kajaani University Consortium (KUC), Regional Unit
RAE2020 code: NSE 13

RU Leader:
Virtanen, Vesa

Professors:

Other PIs: Jaakkola, Mari – Kilpeläinen, Pekka – Virtanen, Vesa

Academic Staff in 2019	19
Professors	0
Senior Researchers	4
Postdoctoral Researchers	0
Doctoral Students	15
Researchers on Personal Grant	0
In Teaching only	0
Of these:	
Principal Investigators	3
Docents (Adjunct Professors)	2

General description of the RU

KUC and its research unit MITY develop and apply measurement technologies in several fields on science and industry. They are a regional institutes serving by their expertise primarily region of Kainuu, but also whole Northern Finland. MITY is focused on two large main areas: cleantech and health & wellbeing. Its main developmental interests are real-time monitoring methods for environmental and waste waters, point-of- care biosensors for diagnostics and self-monitoring, and connected to bioanalytics of natural raw materials, processing and enrichment of plant-based material to high-value products. Despite of focusing on industrial collaboration and developing innovations of its own for commercialization, MITY publishes its work in leading or good international journals and has a wide international collaboration network. Besides MITY, KUC includes unit Adult and Continuing Education Services AIKOPA offering university level education and courses to companies and public organisations (mainly teachers at schools).

Current description of the RU (rating 5)

As the mission of present research unit is to disseminate and make use of advanced technological and scientific knowledge rather than producing new science, many of the above questions are not those that are required to quantify the success of the present research unit.

However, the RU does produce new science at a high level and is publishing this research in the relevant journals, including some publications in the very good journals. The research performed is in general multidisciplinary.

Based on the unit's traditional focus on measurement technology, the unit has branched out and is supporting a broad range of local industries and public partners. To exemplify the very broad range of expertises that the unit provides, it can be mentioned that the unit has supported industrial developments within extraction technology to make optimal industrial use of local products including lingonberries, supports the development of clean-mining techniques with improved instruments for measuring pollutants, as well as the development of saliva-based methods to detect insulin levels for early detection of diabetes.

The research unit does thus provide very competent assistance to a significant number of different private industries as well as public interests. It is thus very well aware of its important societal role and provides very important assistance to developments in the local private and public sector.

Future potential of the RU (rating 5)

Societal impact is core to this RU and is excellently accounted for. The RU presents highly interesting fields of activity for the next years that build on further developments of their measurement technology and will lead also to visible research output. Thus, the unit will continue its developments for clean tech

for sustainable mining, bioeconomy, health and wellbeing, as well as provide support for the local tourist industry. The continued work on biosensors and optimal use of the locally grown fruits or berries is very promising. The unit is unique in the very broad line of expertise it commands.

Given that a University as Oulu must play a very strong role in vitalizing local companies with first-class scientific expertise, the RU seems very well placed in its overall strategy.

The research of the unit is in line with many of the UN-goals for sustainability and will support their realization at the regional level.

The realization of the Scientific Action Plan is far from trivial, as it requires continued influx of expertise as well as continued funding many units, including European, National, OU, and private and public regional partners. However, taking the unit's accomplishments from the last period into account, the goals are highly realistic and feasible. The realization of the goals is subject to the constraint that the region continues to fund the RU. This is absolutely required for its continued existence and development.

Highlights, strengths and development areas, recommendations and overall rating (5)

Highlights:

Competent support to local industry and the public sector within a large number of different fields of expertise.

Strengths and development areas:

The major strength of the research unit is its broad range of competences and its willingness to engage in new and difficult development projects. The unit is therefore a significant contributor to the development of the local industry in the region.

Recommendations:

First of all: the unit should continue its very good work and openness towards new challenges. The unit has a good record of importing and developing advanced knowledge of industrial and/or societal value and this activity should be kept or expanded.

However, industrial advances are becoming more and more complex, and its is unlikely that the unit can support this in general at the highest level. Therefore, the unit should consider whether it could augment its activities by also becoming a facilitator of collaborations between local industry and scientific or technological experts at other national or international institutions. It may be that the unit is already taking this role, but this is not evident from the self-evaluation.

Furthermore, it could of importance for the unit to establish more formal collaborations with similar institutes at the national, Nordic, or European level.

The research of this RU supports the following United Nations Sustainable Development Goals (SDG):

RESEARCH UNIT (RU)	Scientific quality and impact of the research	Societal impact of the research	Quality of the research environment	Future potential	OVERALL ASSESSMENT
KUC - Kajaani University Consortium	Very good	Outstanding	Excellent	Excellent	Excellent
M3S - Empirical Software Engineering in Software, Systems and Services	Outstanding	Outstanding	Outstanding	Excellent	Outstanding
MathSci - Mathematical Sciences	Excellent	Very good	Excellent	Very good	Excellent
Met - Process Metallurgy	Outstanding	Excellent	Excellent	Outstanding	Outstanding
MIC - Microelectronics	Outstanding	Excellent	Outstanding	Outstanding	Outstanding
MME - Materials and Mechanical Engineering	Very good	Excellent	Excellent	Excellent	Excellent
NANOMO - Nano and Molecular Systems Research Unit	Very good	Excellent	Excellent	Excellent	Excellent
NMR - NMR Research Unit	Excellent	Excellent	Excellent	Outstanding	Outstanding
OASIS - Oulu Advanced Research on Service and Information Systems	Very good	Excellent	Excellent	Very good	Excellent
OMS - Oulu Mining School	Excellent	Excellent	Excellent	Excellent	Excellent
OPEM - Opto-Electronics and Measurement Techniques	Excellent	Excellent	Excellent	Very good	Very good
OSA - Oulu School of Architecture	Very good	Excellent	Very good	Very good	Very good
SCT - Structures and Construction Technology	Fair	Good	Fair	Good	Good
SGO - Sodankylä Geophysical Observatory	Excellent	Excellent	Very good	Very good	Excellent
SpaceAstro - Space Physics and Astronomy	Outstanding	Excellent	Outstanding	Excellent	Outstanding
SusChem - Sustainable Chemistry	Good	Very good	Very good	Very good	Very good
UBICOMP - Center for Ubiquitous Computing	Outstanding	Outstanding	Outstanding	Outstanding	Outstanding
WE3 - Water, Energy and Environmental Engineering	Very good	Excellent	Excellent	Excellent	Excellent