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Preface

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PREFACE

Dear colleagues,

We are glad to announce the release of the 4th International Conference of Food and Agriculture (ICOFA-2021). The ICOFA is an annual conference organized primarily by Politeknik Negeri Jember. In this year the theme of our conference is “Scientific and Technological Efforts in Sustainable Food and Agriculture”

Surely, we plan to conduct this conference physically just like the previous ICOFA two years ago in November 2019. However, due to the COVID-19 pandemic, the situation has not subsided, the 4th ICOFA 2021 was carried out virtually as same as ICOFA 2020 by the Zoom meeting platform. We took this option because this conference was already designated and funded. Keynote and invited speakers were also scheduled for this event. Many delegations and authors requested for this conference to be performed, even virtually, since they need it to cover their publication and sharing knowledge requirements.

The key directions of the conference covered the discussion of advanced achievements and touch upon the main aspects of agriculture engineering and biotechnology, organic agriculture, animal science related to food, food science and technology, food safety, food security and sovereignty, IT for agriculture and renewable and novel energy sources.

The conference was run as planned on 6th November 2021 for the plenary session to 7th November 2021 for the parallel session and supported by a virtual event organizer started from 9.00 am to 5.00 PM. Conference models are a Plenary session with keynotes (40 minutes for each keynote speech) and participants' presentations (20 minutes for each presentation). A total of 144 participants (120 presenters and 24 non-presenters) from Universities, Research Institutes, and also Government Departments joined the conference in over five countries from Japan, Thailand, India, South Korea, and Algeria.

Our honorable speakers were Dr. Nishu Gupta SRM from the Institute of Science and Technology, India, Prof. Kyung-Min Kim, Ph.D. from Kyungpook National University, Korea, Prof. Dr. Tosawat Seetawan from Sakon Nakhon Rajabhat University, Thailand and Associate Professor Bibin Bintang Andriana, Ph.D. from Kwansai Gakuin University, Japan.

More than 120 full papers were submitted to the 4th ICOFA 2021. After a pre-review on originality and language, the peer review process was arranged by Editorial Committee and 73 manuscripts were selected for publication in IOP Conference Series: Earth and Environmental Science (EES).



We also wish to thank the keynote speaker, invite speakers, presenters, and participants, and all authors for contributions to the 4th ICOFA 2021 and colleague members of the organizing committee, please accept my deep appreciation for your hard working in ensuring the success of the conference.

Editor-in-Chief, ICOFA 2021

Dr. Ir. Rosa Tri Hertamawati, M.Si, IPM

A list of Steering Committees and Organizing Committees are available in this pdf.

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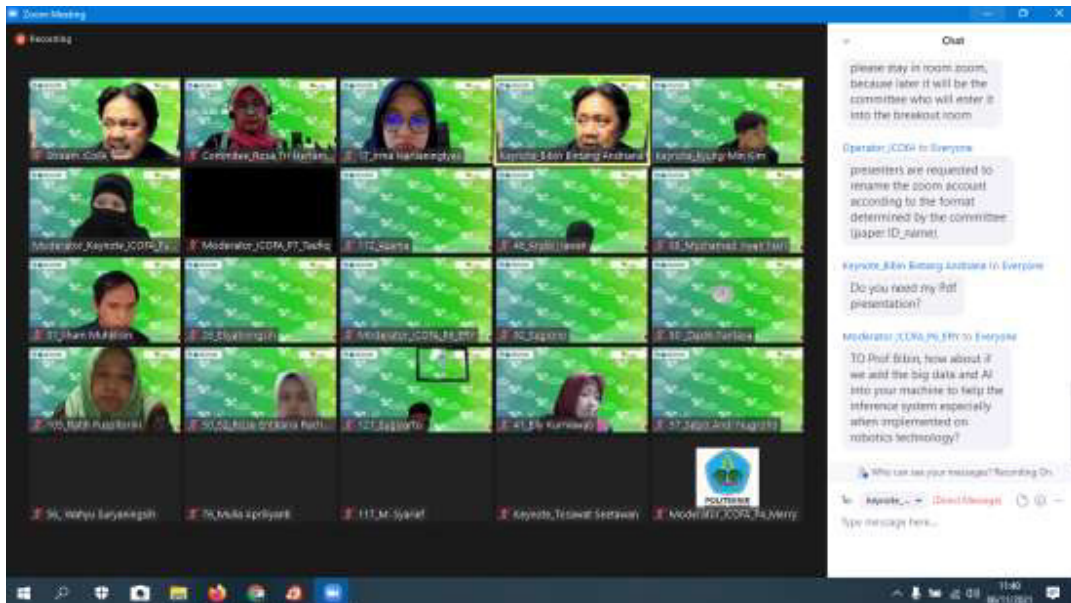
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Conference Photograph

Plenary Session



Seebeck Effect

e^- : Electron
 h^+ : Hole
 ϕ : Phonon
 m : Magnon
 U : Internal Energy
 Q : Heat
 W : Work
 P : Pressure
 T : Temperature
 s : Entropy

2^{nd} : $\Delta U = Q - W$
 (in contact with another system):
 $\Delta U \geq 0$
 $dU = Tds - PdV$

Seebeck coefficient

$$S = \frac{V_{seebeck}}{T_h - T_c}$$

Ohm's Law

$$I = \frac{Q}{R}$$

$$v_d(h^+) = v_d(e^-)$$

$$\vec{v}_e = -\sum_j (n_j v_j + N_j) \vec{E}$$

$$\vec{J} = \sigma \vec{E} = -\sum_{j=1}^n (n_j q_j v_j + N_j q_j) \vec{E}$$

Current Density

$$\vec{J} = \sigma \vec{E} = -\sum_{j=1}^n (n_j q_j v_j + N_j q_j) \vec{E}$$

Joule's Law

$$P = V_{se} I = \sum Q = I^2 R$$

In 1821, Germany Physicist

Thomas Johann Seebeck 1770-1831

Keynote Session ICoFA and Discussion, Moderator: (Room 1)

Prof Dr Tosawat Seetawan

Sakon Nakhon Rajabhat University,
Thailand

Insulators Vs Semiconductors Vs Metals

Carrier Concentration (10^{-14} to 10^{23})

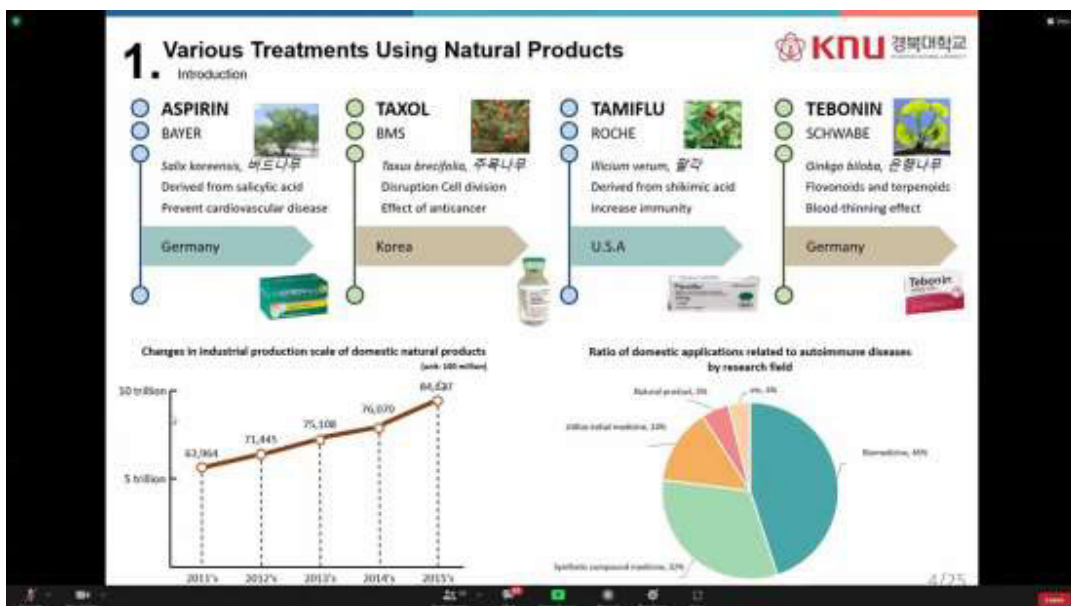
Electron thermal conductivity k_e

Lattice thermal conductivity k_l

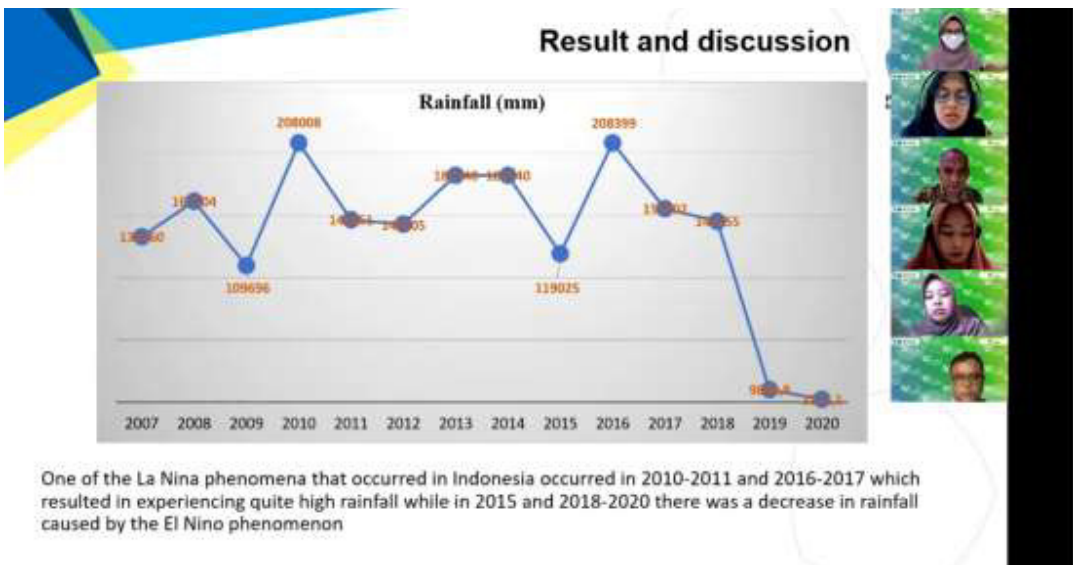
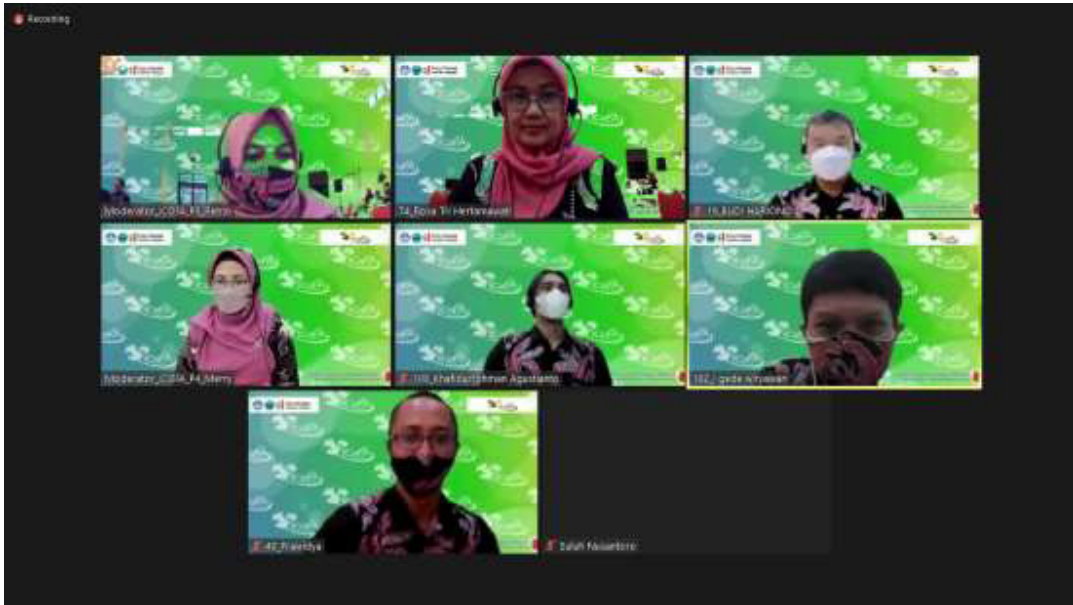
- TE materials has low gap semiconductors.
- Optimizing power factor by highly doped semiconductors.
- If doping is increased, the electrical conductivity increases but the Seebeck coefficient is reduced.
- Ideal materials: $S \uparrow, \rho \downarrow, \lambda \uparrow$ but $S \uparrow \Leftrightarrow \rho \uparrow$ or $\rho \downarrow \Leftrightarrow \lambda \uparrow$
- Best compromise is still highly doped semiconductors ($k = k_e + k_l$)

Sakon Nakhon Rajabhat University, THAILAND





Parallel Session



INTRODUCTION



Development of crude palm oil (CPO) in Indonesia



- Impacts the amount of waste produced
- Oil palm empty fruit bunches (OPEFB) which cover 30-35% of the total weight of fresh fruit bunches
- Hardly degrade and produce gases such as CH₄, H₂S, NH₃ and NO_x

Validity and Reliability Test

1. Validity test is a test carried out to perform factor analysis based on the variables in this study. Requirements for the Validity Test, namely the KMO of > 0.5. Result : can be further processed

2. Table Cronbach's Alpha . Reliability Test

No	Variable	Cronbach's Alpha Value
1	System Quality	0,614
2	Information Quality	0,765
3	Service Quality	0,695
4	User Intention	0,621
5	User Satisfaction	0,653
6	Net Benefits	0,709

RESULT

Parameters	Parameter Items	Location of Observation		
		Dung River	Jompo River	Sisoni R.
Physics	Temperature (°C)	25.7	25.1	26.6
	Water Colour	Brownish green	Light gray & Brown	Brownish
	Smell	No smell	Smells	Smell
	Depth	> 6 meters	> 6 meters	>10 meters
	Nitrite	0.041 mg/L	0.358 mg/L	0.091 mg/L
Chemical	Nitrate	9.2 mg/L	10.6 mg/L	7.8 mg/L
	Ammonia	0.022 mg/L	0.047 mg/L	0.006 mg/L
	BOD	1.93 mg/L	6.84 mg/L	3.30 mg/L
	Phosphat	0.44 mg/L	0.34 mg/L	0.39 mg/L
	DO	28.5 mg/L	16 mg/L	12.6 mg/L
Biology	pH	8.15	7.63	7.32
	TDS	208 mg/L	174 mg/L	727 mg/L
	Parikton Density:			
	Cyctoisella	200 cell/ml	-	-
	Licmophora	-	50 cell/ml	50 cell/ml
	Navicula	150 cell/ml	400 cell/ml	20 cell/ml
	Nitzschia	50 cell/ml	-	50 cell/ml
	Pleurosigma	5 cell/ml	5 cell/ml	-
	Chlorophyceae	500 cell/ml	-	-
	Bacteria Density :			
	Oscillatoria	-	50 unit/ml	-
	Macrozoobentos :			
	Brocra testudinaria	found	-	-
	Brocra costula	found	found	-
	Pomacea canaliculata	found	found	-
Viviparus javanica	found	found	-	
Anadara granosa	-	-	found	
Uca sp.	-	-	found	

Table 1. Mortality of *Bactrocera dorsalis* larvae after heating using VHT (%)

duration (minute)	Heat temperature (°C)		
	40	45	50
0	0	0	0
5	0	3.3	30
10	0	20	76