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*Prof. Dr. Drs. Syahrul Humaidi, M.Sc was born in Rantau Prapat on May 17, 1965, and is a physics lecturer. He also holds the position of Head of the Master's Program in Physics and the Doctoral Program in Physical Science at Universitas Sumatera Utara. He completed his final degree, a doctoral degree in physics, at USU in 2017.*

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## Publications

2026

Jurnal internasional bereputasi

### **Optimization of L-cysteine as a nitrogen and sulfur source in carbon dots synthesized from shrimp shells as supercapacitor electrodes**

MUHAMMADIN HAMID , SYAHRUL HUMAIDI , NURSAL , Noor Haida Mohd Kaus

2026

Jurnal internasional bereputasi

### **Design and Development of a Water Flow Monitoring Device using Mitsubishi FX3U-14MT PLC**

DOLI BONARDO , HERRI TRISNA FRIANTO , SYAHRUL HUMAIDI , Dr. KERISTA TARIGAN, M.Eng.Sc. , DADAN RAMDAN , FAUZAN AMRI

2026

Buku referensi

### **Robotika dan Otomasi Pintar (Sistem Kontrol Berbasis AI)**

DOLI BONARDO , SYAHRUL HUMAIDI , HERRI TRISNA FRIANTO

2025

Jurnal internasional bereputasi

### **4Frequency response-based optimization of PID controllers for enhanced fluid control system performance**

SYAHRUL HUMAIDI

2025

Jurnal internasional bereputasi

### **Frequency response-based optimization of PID controllers for enhanced fluid control system performance**

DOLI BONARDO , HERRI TRISNA FRIANTO , SYAHRUL HUMAIDI , Dr. KERISTA TARIGAN, M.Eng.Sc. , DADAN RAMDAN

2025

Jurnal internasional bereputasi

### **The Influence of Yttrium Doping on The Microstructure and Magnetic Properties of Barium Hexaferrite**

SYAHRUL HUMAIDI

2025

Jurnal internasional bereputasi

### **Exploring the impact of ambient annealing on the superconducting properties of Y-123 with marine waste-derived chitosan additives**

SYAHRUL HUMAIDI

2025  
Prosiding seminar internasional

## **Preparation and characterization of barium hexaferrite via the solid-state reaction method**

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Jurnal internasional bereputasi

## **Recent advances in silver oxide-based superconductors: characterization, challenges and theoretical progress**

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2025  
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## **Polyethylene glycol-magnetite composite encapsulated concrete as a thermal energy storage**

SYAHRUL HUMAIDI

2025  
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## **Thermal Characterization on Asphalt Modification with Polyethylene and Polyethylene Grafted Maleic Anhydride**

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Jurnal internasional bereputasi

## **Thermal Characterization on Asphalt Modification with Polyethylene and Polyethylene Grafted Maleic Anhydride**

WINSYAH PUTRA RITONGA , SYAHRUL HUMAIDI , MOTLAN , EDDIYANTO

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Jurnal internasional bereputasi

## **Comparing study of electrical transport properties of bulk Y-123 synthesized by modified wet and dry synthesis methods**

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2025  
Jurnal internasional bereputasi

## **Overcurrent effects on copper insulated PVC cables and fire resistance via thermal imaging and macrostructure analysis**

SYAHRUL HUMAIDI

2025  
Jurnal internasional bereputasi

## **ENCAPSULATION OF PHASE CHANGE MATERIAL-MAGNETITE (Fe<sub>3</sub>O<sub>4</sub>) COMPOSITE IN NOVEL COPPER TUBE CONFIGURATION (VERTICAL AND HORIZONTAL) FOR THERMAL STORAGE APPLICATION**

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## **Paraffin and magnetite composite for thermal management applications**

SYAHRUL HUMAIDI

2025  
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## **Characteristics of Rainfall Influence Indian Ocean Dipole (IOD) and Madden Julian Oscillation (MJO) Phenomena Based on Machine Learning in Deli Serdang Region**

MARZUKI SINAMBELA , SYAHRUL HUMAIDI

2025  
Prosiding seminar internasional

## **Convective clouds classification based on weather forecast for air traffic flow management in Kualanamu Airport**

MARZUKI SINAMBELA , SYAHRUL HUMAIDI , SUNARDI

2025

Prosiding seminar internasional

## **Convective clouds classification based on weather forecast for air traffic flow management in Kualanamu Airport**

SUNARDI , SYAHRUL HUMAIDI , MARHAPOSAN SITUMORANG , MARZUKI SINAMBELA

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Jurnal internasional bereputasi

## **Phase formation, microstructural and superconducting properties of YBCO added Ca-compounds extraction eggshells**

SYAHRUL HUMAIDI

2025

Jurnal internasional bereputasi

## **Study of Crystal Structure, Lattice Strain, and Elemental Content of Natural Iron Sand Nanoparticles Synthesized by the Coprecipitation Method**

SYAHRUL HUMAIDI

2024

Tulisan ilmiah

## **Karakteristik dan Klasifikasi Awan Konvektif Menggunakan Satelit Himawari dengan Pendekatan Model Convolution Neural Network untuk Mitigasi Keselamatan Penerbangan di Wilayah ...**

MARZUKI SINAMBELA , SYAHRUL HUMAIDI , SUNARDI

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## **Enhancing superconducting properties of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub> through Nd<sub>2</sub>O<sub>3</sub> addition prepared using modified thermal decomposition method**

SYAHRUL HUMAIDI

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## **Application of Convolutional Neural Networks (CNN) for Optimizing Route Changes Based on Dynamic Weather Conditions and Travel Time**

SYAHRUL HUMAIDI

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Prosiding seminar internasional

## **Application of Convolutional Neural Networks for optimizing route changes based on Dynamic weather conditions and travel time**

SUNARDI , MARZUKI SINAMBELA , SYAHRUL HUMAIDI , MARHAPOSAN SITUMORANG

2024

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## **DEVELOPMENT OF A MATHEMATICAL MODEL FOR MANAGING SCHEDULE DELAYS IN AIR TRAFFIC OPERATIONS**

SYAHRUL HUMAIDI

2024

Jurnal internasional

## **Development of a mathematical model for managing schedule delays in air traffic operations**

SUNARDI , SYAHRUL HUMAIDI , MARHAPOSAN SITUMORANG , MARZUKI SINAMBELA

2024

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## **Spatial evaluation rainfall estimation on weather radar using Marshall-Palmer reflectivity-rainfall rate in Banten**

MARZUKI SINAMBELA , SYAHRUL HUMAIDI , HARTANTO

2024

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## **Effect of Sintering Temperature on AC Susceptibility and Superconducting Properties of (Bi<sub>1.6</sub>Pb<sub>0.4</sub>)Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8</sub> Superconductor**

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## **UV Exposure Time Optimization for Enhanced Conversion, Hardness, and Flexural Strength in UDMA/TEG-DMA Composite Resins**

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## **Spatial evaluation rainfall estimation on weather radar using Marshall-Palmer reflectivity-rainfall rate in Banten**

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## **Enhanced Cancer Biomarker Detection using Fe<sub>3</sub>O<sub>4</sub> Magnetic Nanoparticles: Synthesis, Surface Modifications and Diagnostic Applications: A Review**

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## **Distance Measurement of Low Reflectance Objects Using Indirect Time of Flight LiDAR**

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## **Application of Convolutional Neural Networks (CNN) for Optimizing Route Changes Based on Dynamic Weather Conditions and Travel Time**

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## **Fluctuation induces conductivity and microstructural studies in Y-123: Effect of CaO inclusion**

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## **Effect of graphite as filler on conductive polymer composites based on corn starch and liquid natural rubber on its electric conductivity properties**

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2024

Prosiding seminar internasional

## **Thermoelectric material based on ti doped CuCrO<sub>2</sub> by sol-gel method**

NONI SURTIANA SILALAH , SYAHRUL HUMAIDI

2024

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## **Study and characterization of BaFe<sub>12</sub>O<sub>19</sub>/PVDF composites as electrode materials for supercapacitors**

SYAHRUL HUMAIDI

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## **Microstructural and excess conductivity properties of Y-123: effect of organic polymer chitosan inclusion**

FITRI KHOERUNNISA , SYAHRUL HUMAIDI

2024

Jurnal internasional bereputasi

## **Microstructural and excess conductivity properties of Y-123: effect of organic polymer chitosan inclusion**

SYAHRUL HUMAIDI

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Prosiding seminar internasional

## **Effect of BaCO<sub>3</sub> addition on critical temperature of Bi-Pb-Sr- Ca-Cu-O superconductor**

SYAHRUL HUMAIDI

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## **Study and characterization of BaFe<sub>12</sub>O<sub>19</sub>/PVDF composites as electrode materials for supercapacitors**

MUHAMMADIN HAMID , SYAHRUL HUMAIDI

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## **Analysis of Strong Wind Characteristics Using Doppler Weather Radar over Kualanamu Airport Indonesia**

YAHYA DARMAWAN , SYAHRUL HUMAIDI , ELLYA VERONIKA IRIANI MANURUNG

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## **The subjectivity portrayed in online news under the theme of COVID-19 in Indonesia**

MUHAMMAD YUSUF , SYAHRUL HUMAIDI

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## **Mood congruency in COVID-19 podcast discourse: an interpersonal meaning analysis**

SYAHRUL HUMAIDI , MUHAMMAD YUSUF

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## **Electrochemical Performance of Na<sub>2</sub>Mn<sub>3</sub>O<sub>7</sub> as a Cathode Material in Sodium-Ion Batteries Using the Precipitation Method with Ethylene Glycol Chelating Agent**

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## **Effect of Co doping on the synthesis of CuCrO<sub>2</sub> materials using solid-state method**

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## **Evaluation of Meteorological Radar Precipitation Forecast in Banten**

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2024

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## **Synthesis and characterization of CuCrO<sub>2</sub> with addition of CaCO<sub>3</sub> using solid state reaction and sol-gel method**

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## **Effect of Co Doping on the Synthesis of CuCrO<sub>2</sub> Materials Using Solid-State Method**

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## **Synthesis and characterization of CuCrO<sub>2</sub> with addition of CaCO<sub>3</sub> using solid state reaction and sol-gel method**

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## **Investigating the Impact of Polyvinyl Alcohol Addition on the Thermal Behavior and Chemical Structure of Electrospun Cellulose Nanofibers**

TENGGU ADETYA NURHALIZA , SYAHRUL HUMAIDI

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## **The effectiveness of activated carbon from nutmeg shell in reducing ammonia (NH<sub>3</sub>) levels in fish pond water**

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## **Palm Oil Fuel Ash and Fly Ash for a Partial Replacement of Cement in High-Quality, Environmentally Friendly Mortar as a Solution to Industrial Waste**

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## **Comprehensive Analysis of Dry Material Content, Moisture Content, and FTIR Spectroscopy in Durian Peel**

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## **Palm Oil Fuel Ash and Fly Ash for a Partial Replacement of Cement in High-Quality, Environmentally Friendly Mortar as a Solution to Industrial Waste**

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## **Spatial evaluation rainfall estimation on weather radar using Marshallâ Palmer reflectivityâ rainfall rate in Banten**

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## **DEVELOPMENT OF A MATHEMATICAL MODEL FOR MANAGING SCHEDULE DELAYS IN AIR TRAFFIC OPERATIONS**

MARZUKI SINAMBELA , SYAHRUL HUMAIDI , SUNARDI

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## **Experimental Study on Capillarity and Thermal of Metal Foam as the Wick Structure in Heat Pipe Application**

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## **Experimental study on capillarity and thermal of metal foam as the wick structure in heat pipe application**

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## **Response of Geologic Units to The Ground Parameters of Tarutung Earthquake 2022 Mw 5.8 : A Preliminary Study**

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## **Effect of calcination frequency on the thermoelectric properties of Ti doped CuCrO<sub>2</sub> by solid state method**

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## **ANALYSIS OF MINERAL CONTENT AND MAGNETIC PROPERTIES OF IRON SAND OF BAH BOLON SIMALUNGUN RIVER, NORTH SUMETERA**

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## **Annealing temperature effects on the size and band gap of ZnS quantum dots fabricated by co-precipitation technique without capping agent**

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## **Thematic Construction in the News Coverage of the COVID-19 Pandemic: The Pattern and Its Implication in Teaching English News-Item Text**

MUHAMMAD YUSUF , SYAHRUL HUMAIDI

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## **INDENTIFICATION OF CHICKEN IN CHICKEN, BEEF AND LAMB EXPERIMENTS USING CONDUCTING POLYMER SENSOR SERIES AND KOHONEN ALGORITHM METHOD**

MARHAPOSAN SITUMORANG , BENRAD EDWIN SIMANJUNTAK , Marzuki Sinambela , SYAHRUL HUMAIDI

2023  
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## **Characterization of Meteorological Drought Using Standardized Precipitation Index and Standardized Precipitation Evapotranspiration Index Methods in North Sumatera**

FANLY PARHIMPUNAN MANULLANG , SYAHRUL HUMAIDI , DEASSY EIRENE DIANA DOLOKSARIBU , Dr. KERISTA TARIGAN, M.Eng.Sc. , MARHAPOSAN SITUMORANG , YAHYA DARMAWAN

2023  
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## **CHARACTERIZATION OF ASPHALT MODIFICATION USING GROUND RUBBER AND REACTIVE RUBBER NR-g-MA AS COMPATIBILIZER**

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2023  
Jurnal nasional terakreditasi

## **Synthesis and Electrochemical Characterization of Sodium-Ion Battery Anode Carbon Biomassa Based on Sunflower Seed Husk (*Helianthus annuus*)**

DINDA AMILIA , SYAHRUL HUMAIDI

2023  
Prosiding seminar internasional

## **Synthesis and characterization of nanocomposites Fe<sub>3</sub>O<sub>4</sub>-ZnO**

JULIANDI SIREGAR , SYAHRUL HUMAIDI , KERISTA SEBAYANG , ZURIAH SITORUS , BRIAN YULIARTO

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## **Preparation and characterization of liquid natural rubber modified asphalt by using wet mixing method**

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## **Preparation and characterization of liquid natural rubber modified asphalt by using wet mixing method**

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## **1-Dimensional Model of Seismic Velocity after Tarutung Earthquake 1 October 2022 Mw 5.8**

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## **Faulting Mechanism of Tarutung Earthquake 2022 Mw 5.8 Using Moment Tensor Inversion: A Preliminary Study**

SYAHRUL HUMAIDI , ENDAH PUSPITA SARI

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## **Annealing temperature effects on the size and band gap of ZnS quantum dots fabricated by co-precipitation technique without capping agent**

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## **Synthesis and characterization of WO<sub>3</sub> sensitive layers for NO<sub>2</sub> gas sensor application**

SYAHRUL HUMAIDI

2023

Artikel ilmiah

## **Manufacture of Lithium Lanthanum Titanate Active Material as a Lithium-Ion Capacitor Anode Using Solid-State Reaction Methods**

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Prosiding seminar internasional

## **Preparation of Cu<sub>2</sub>O/ZnO nanocomposites for visible light photocatalytic activity for methylene blue degradation**

KERISTA SEBAYANG , Dr. KERISTA TARIGAN, M.Eng.Sc. , SYAHRUL HUMAIDI

2023

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## **Variability of the thermocline layers during Indian Ocean dipole phenomenon in the western waters of Sumatra**

KURNIA SEMBIRING , MARHAPOSAN SITUMORANG , SYAHRUL HUMAIDI , Dr. KERISTA TARIGAN, M.Eng.Sc.

2023

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## **Synthesis And Characterization Of Nanocomposites Fe<sub>3</sub>O<sub>4</sub>- ZnO**

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Jurnal nasional terakreditasi

## **Rainfall Characteristics In Medan City With Pearson Correlation Analysis (Case Study Of February 27, 2022)**

SYAHRUL HUMAIDI , ENDAH PARAMITA

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Jurnal internasional bereputasi

## **Effect of surface coating on changes in mass and heat rate on hydrophobic layer coated metal foam**

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2023

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## **Synthesis and Characterization of Cu-Cr-O Phase with H<sub>2</sub>SO<sub>4</sub> Solvent Using Sol-Gel Method**

YUSRIDAH RANGKUTI , SYAHRUL HUMAIDI

2023

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## **Characterization of CuCrO<sub>2</sub> Material Produced Using Sol-Gel Method**

SYAHRUL HUMAIDI

2023  
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## **EFFECT OF SURFACE COATING ON CHANGES IN MASS AND HEAT RATE ON HYDROPHOBIC LAYER COATED METAL FOAM**

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2023  
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## **Enhanced superconducting transition temperature for Cr-substituted $Tl_2Ba_2CaCu_2O_{8-x}$**

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## **Cyclic Oxidation Resistance of $MoSi_2$ Added FeCrAlTiY Coatings on ST41 Steel at 700°C Prepared by a Flame Spraying Technique**

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## **AC Susceptibility and Electrical Properties of Ta-Substituted $(TlTa)SrCaCuO$ Superconductor**

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## **Effect of post-consumer plastic polyethylene and grafted maleic anhydride on polyethylene (PE-g-MA) additive on the properties of asphalt binder**

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## **Physical and Chemical Properties of Modified Asphalt with Post Consumer Polyethylene in the Presence of Reactive Polymer**

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## **Surface treatment on metal foam wick of a ferrofluid heat pipe**

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## **Superhydrophobic coated metal foam for PEM fuel cell application**

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2022  
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## **The influence of carbon addition on the superconducting properties of BPSCCO**

SYAHRUL HUMAIDI , EKA FEBY RONAULI LUBIS

2022  
Prosiding seminar internasional

## **Superconducting Properties of Ta Substituted $(Tl_{1-x}Ta_x)(BaSr)CaCu_2O_7$**

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2022  
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## **Superconducting Properties of Ta Substituted $(Tl_{1-x}Ta_x)(BaSr)CaCu_2O_7$**

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2022  
Jurnal internasional bereputasi

## **Effect of surface area on electrical properties of $NiCo_2O_4$ -reduced graphene oxide nanocomposites for supercapacitor electrodes applications**

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Prosiding seminar internasional

### **Synthesis of Carbon from Yellowfin Tuna Fishbone to Remove Iron (Fe) Metal in Well Water from Bandar Setia**

SYAHRUL HUMAIDI

2022

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### **Manufacture of Solid Polymer Electrolyte (SPE) Based on PVDF HFP-LiBOB**

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2022

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### **XRD Analysis of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ with Post Heat Treatment for Lithium-ion Capacitor (LIC) Applications**

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### **Synthesis and material characterization of calcium carbonate ( $\text{CaCO}_3$ ) from the waste of chicken eggshells**

SYAHRUL HUMAIDI

## **Researches**

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Kerjasama Luar Negeri dan Publikasi Internasional

### **Analysis of Current Density and Critical Temperature Fluctuation on High Temperature Superconductor Based Tl-2212**

SYAHRUL HUMAIDI

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Kerjasama Luar Negeri dan Publikasi Internasional

### **Activated Carbon from Biomass Waste Candlenut Shells (*Aleurites Moluccana*) Doped ZIF-67 Supported $\text{Fe}_3\text{O}_4$ as Advanced Materials for Supercapacitor**

MUHAMMADIN HAMID , SYAHRUL HUMAIDI , Isnaeni

2022

Penelitian Tim Pasca Sarjana

### **Pengaruh Penambahan $\text{MnO}_2$ terhadap Peningkatan Temperatur Kritis Superkonduktor Suhu Tinggi $\text{CuCrO}_2$**

SYAHRUL HUMAIDI , NURUL MAULIDA RAHMAHYANI NST

2022

Penelitian Disertasi Doktor

### **Modifikasi Aspal Dengan Karet Ban Bekas Menggunakan Bahan Penyerasi Karet Alam Fungsional Maleat Anhidrat NR-g-MA.**

SYAHRUL HUMAIDI , WINSYAHPUTRA RITONGA

2022

Kerjasama Luar Negeri dan Publikasi Internasional

### **WCU Modifikasi Proses Sintering Terhadap Peningkatan Temperatur Kritis Superkonduktor Suhu Tinggi $\text{Bi}_{1.6}\text{Pb}_{0.4}\text{Sr}_2\text{Ca}_{1-x}\text{M}_x\text{Cu}_2\text{O}_8$ (M=Ce,Na,Mg)**

SYAHRUL HUMAIDI

2022

Penelitian Tim Pasca Sarjana

### **Pembuatan Nanopartikel Magnesium Ferrite Sebagai Penyerap Limbah Ion Logam Berat Timbal dan Tembaga dengan Metode Co-Presipitasi**

SYAHRUL HUMAIDI , SHIAMNY NUR KHAIR TARIGAN

2022

Penelitian Disertasi Doktor

## **Pendekatan Model Artificial Neural Network Menggunakan Satelit Himawari 8 untuk Meningkatkan Keamanan Jalur Penerbangan di Sumatera Utara**

SYAHRUL HUMAIDI , SUNARDI

2021

Penelitian Fundamental

## **Subjektifitas Dan Fungsi Tekstual Dalam Berita Terkait Covid-19 Pada Media Massa Nasional**

MUHAMMAD YUSUF , SYAHRUL HUMAIDI

2021

Penelitian Dana Lokal Perguruan Tinggi

## **Kongruensi Dalam Podcast Youtube Bertema Covid-19**

MUHAMMAD YUSUF , SYAHRUL HUMAIDI

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Penelitian Tim Pasca Sarjana

## **Pengaruh Waktu Milling (Milling Time) dan Penambahan FeMn terhadap Kekerasan dan Sifat Magnet Barium Heksaferit**

SYAHRUL HUMAIDI , LIDIA PUSPITA SARI SAGALA

2020

Penelitian Tim Pasca Sarjana

## **Pembuatan Sensor Gas Beracun (Toxid) Berbahan Dasar Timah Oksida (SnO<sub>2</sub>)**

SYAHRUL HUMAIDI , DOLI BONARDO

2020

Penelitian Tim Pasca Sarjana

## **Pembuatan Sensor Gas Beracun (Toxid) Berbahan Dasar Timah Oksida (SnO<sub>2</sub>)**

SYAHRUL HUMAIDI

2020

Penelitian Fundamental

## **Penggunaan Penstabil Tegangan Sebagai Penghemat Energi pada Proses Sterilisasi Susu Sapi dengan Metode Ignition Coil**

Dr. KERISTA TARIGAN, M.Eng.Sc. , SYAHRUL HUMAIDI

2019

Penelitian Tim Pasca Sarjana

## **Pengaruh Penggantian Atom (Be, Mg, Ra dan Li) dan Modifikasi Pembuatan Sampel terhadap Peningkatan Temperatur kritis Bahan Superkonduktor BPSCCO-2223**

Dr. KERISTA TARIGAN, M.Eng.Sc. , SYAHRUL HUMAIDI

2014

Penelitian Disertasi Doktor

## **Pengaruh Penambahan Cr<sub>2</sub>O<sub>3</sub> terhadap Peningkatan Temperatur Kritis dan Kestabilan**

SYAHRUL HUMAIDI

## **Community Services**

2022

Ipteks Bagi Masyarakat

## **Konversi Motor Diesel ke Motor Listrik 15 kW untuk Ekstruder Pelet Apung Pakan Ikan Lele di Desa Bandar Klippa Medan Tembung**

MUHAMMADIN HAMID , SYAHRUL HUMAIDI , EMIA PEPAYOSA BARUS , IVI BRILIANSI DALIMUNTHE , DINDA AMILIA , TB. MUHAMMAD AULIA SABILILLAH , HADI WIJOYO

## **Intellectual Property Rights**

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2026  
Hak cipta nasional

**Robotika dan Otomasi Pintar (Sistem Kontrol Berbasis AI)**

DOLI BONARDO , SYAHRUL HUMAIDI , HERRI TRISNA FRIANTO

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2025  
Patent nasional

**Metode Pembuatan Nano Adsorben untuk Remediasi Air Tercemar Logam Berat**

SYAHRUL HUMAIDI

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2024  
Patent nasional

**ALAT PENURUN KADAR ASAM LEMAK BEBAS TEGANGAN TINGGI**

SYAHRUL HUMAIDI

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2024  
Patent nasional

**Proses Pembuatan Bio Baterai Berbasis Hasil Fermentasi Limbah Jeruk Manis (sitrus sinensis) dan Baterai Bekas Yang Ditambahkan Gel PVA (Poly Vinyl Alcohol)**

SYAHRUL HUMAIDI

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2023  
Hak cipta nasional

**Keselamatan Ketenagalistrikan (K2)**

SYAHRUL HUMAIDI

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2020  
Patent nasional

**Metode Untuk Meningkatkan Temperatur Kritis Pada Bahan Superkonduktor Suhu Tinggi (TlBa2CaCu2O8-d) Dengan Penambahan Cr2O3**

SYAHRUL HUMAIDI

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