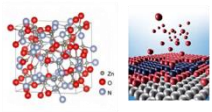
Center for Electronic Materials

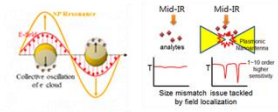
Head, Dr.Chong-Yun Kang
+82-2-958-6722
cykang@kist.re.kr

Develop core technology of electronic materials and components for the next generation electronics

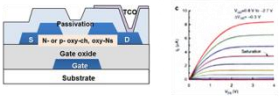
The primary research goal of Center for Electronic Materials is to develop the original technologies of designing, processing, and characterizing electronic materials and devices for the future information/energy technology. Our research areas range from the material level to device applications and focus on capacitive, resistive/conductive, and photonic-convergent materials and their applications in electronic devices.



Smart electronic materials



Optofunctional materials



Applications

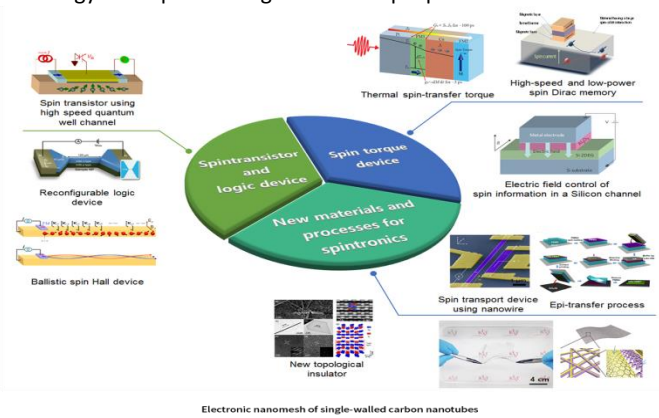
Computational materials design

Center for Spintronics

Head, Dr.Hyunchul Koo
+82-2-958-5423
hckoo@kist.re.kr

While the conventional electronic device technology uses only the charge characteristics of electrons, the spintronics utilizes spin information as well as charge flow to overcome the physical limits of current technology.

The spintronic device has excellent characteristics such as high speed and ultra low power consumption as well as non-volatility which are intrinsic characteristics of spin, and has attracted attention as a next generation device. We are devoting much effort to research the core technology for implementing new-concept spintronic devices.



Electronic nanomesh of single-walled carbon nanotubes

Center for Opto-electronic Materials & Devices

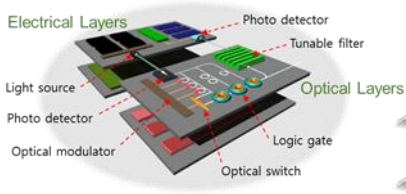
Head, Dr.Jindong Song
+82-2-958-5735
jdsong@kist.re.kr

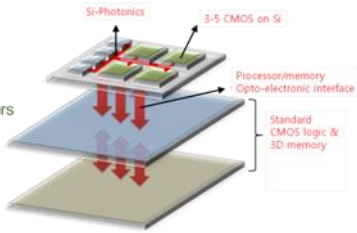
Opto-Electronics for optical signal management

We develop the Opto-electronic fusion technology to cope with high speed data flow of exaflops (10^{18}) for IoT, Big data era. The core technology includes optical logic gate, high speed detectors, variable filters.

Research on III-V on Si platform to overcome conventional Si CMOS

We aim to provide a new platform realizing III-V devices on other substrate such as Si using epitaxial growth and wafer bonding technology to overcome conventional Si CMOS.
Mid-IR and Far-IR sensors are being developed using quantum well and quantum dot.



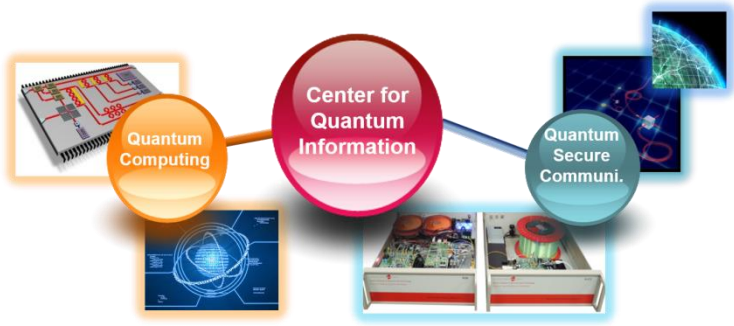


Center for Quantum Information

Head, Dr.Sung Moon
+82-31-546-7471
s.moon@kist.re.kr

We are preparing for the upcoming "Quantum Age" by studying fundamentals of quantum science and developing key technologies in quantum engineering.

Our mission is to lead scientific and technological innovations around the globe by examining a wide range of research in quantum science and its applications, including quantum communications and quantum computing.



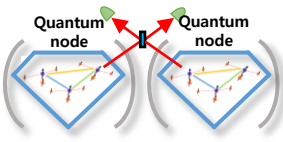
Open Research Program

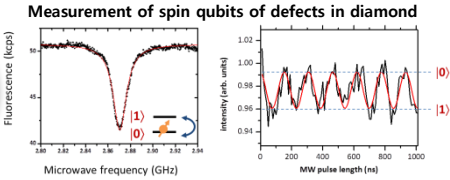
☐ Quantum Computing

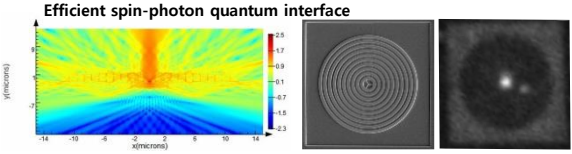
PI : Dr.Yong-Su Kim
+82-31-546-7476
yong-su.kim@kist.re.kr

We develop core technologies for photon-atom hybrid quantum computing

Quantum computing is a new concept of high-speed computing that utilizes quantum superposition and quantum entanglement. The quantum computing project aims to develop photon-atom hybrid quantum computing model and the core technologies. Exploring new quantum phenomena and finding applications using developed quantum computing platform are also important parts of this project.







☐ Neuromorphic computing

PI : Dr.Doo Seok Jeong
+82-2-958-5490
dsjeong@kist.re.kr

We develop solutions to hardware artificial intelligence engine (neuromorphic processor) and its forward-looking applications

The focus of our research is on developing neuromorphic processors, the front-runner among artificial intelligence engines. Detailed research fields include (1) learning algorithm for spiking neural network, (2) architecture design of spiking neural network, (3) digital/analog circuit design, (4) high-density nonvolatile memory