

## Keywords List

Keywords are for Subject and Materials Indexes. The Subject index is divided into three classes: (1) Theoretical Methods, (2) Experimental Methods, and (3) Phenomena.

The Materials Index is also classified into three classes; (1) Elemental and Chemical Identity, (2) Physical State, and (3) Electrical and Magnetic Behavior.

You may use multiple keywords in the above mentioned six classes up to a maximum of five in total.

You can add three keywords out of this list.

## Subject index

### (1) Theoretical methods

- Ab initio quantum chemical methods and calculations
- Atom-solid interactions, scattering, diffraction
- Atomistic dynamics
- Computer simulations
- Construction and use of effective interatomic interactions
- Density functional calculations
- Electron density, excitation spectra calculations
- Electron\_solid interactions, scattering, diffraction
- Equilibrium thermodynamics and statistical mechanics
- Green's function methods
- Ion-solid interactions, scattering, channeling
- Ising models
- Jellium models
- Many body and quasi-particle theories
- Mean field theory
- Models of non-equilibrium phenomena
- Models of non-linear phenomena
- Models of surface chemical reactions
- Models of surface kinetics
- Molecular dynamics
- Monte Carlo simulations
- Non-equilibrium thermodynamics and statistical mechanics
- Semi-empirical models and model calculations

### (2) Experimental methods

- Adsorption isotherms
- Appearance potential spectroscopy
- Atom-solid reactions
- Atom-solid scattering and diffraction

- (elastic)
- Atom-solid scattering and diffraction (inelastic)
- Atomic force microscopy
- Atom/molecule manipulation
- Auger electron spectroscopy
- Chemical vapor deposition
- charge density waves
- Desorption induced by electronic transitions (DIET)
- Angle resolved DIET (including electron stimulated desorption ion angular distribution (ESDIAD))
- Electron stimulated desorption (ESD)
- Photon stimulated desorption (PSD)
- Surface photochemistry
- Electrical transport measurements
- Electrochemical methods
- Electron emission measurements
- Energy technology
- Environmental engineering
- Exoelectron emission
- Fermi surface mapping
- Field emission measurements
- Information science and technology
- Multi-probe method
- Photoemission (total yield)
- Secondary electron emission measurements
- Thermally-stimulated emission
- Electron energy loss spectroscopy (EELS)
- Electron microscopy
- Ballistic electron emission microscopy (BEEM)
- Low-energy electron microscopy (LEEM)
- Reflection electron microscopy (REM)
- Scanning electron microscopy (SEM)
- Scanning transmission electron microscopy (STEM)
- Electron-solid diffraction
- Auger electron diffraction
- Lithography
- Low energy electron diffraction (LEED)
- Photoelectron diffraction measurement
- Photoelectron holography
- Reflection high-energy electron diffraction (RHEED)
- Transmission high-energy electron diffraction
- Electron-solid scattering and transmission - elastic
- Electron-solid scattering and transmission - inelastic
- Electron spin resonance
- Ellipsometry

- Field emission microscopy
  - Field emission spectroscopy
  - Field ion microscopy
  - Four-point probe conductivity measurement
  - Inverse photoemission spectroscopy
  - Inelastic tunneling spectroscopy
  - Ion etching
  - Ion implantation methods
  - Ion scattering spectroscopy
  - High energy ion scattering (HEIS)
  - Low energy ion scattering (LEIS)
  - Medium energy ion scattering (MEIS)
  - Isotopic exchange/traces
  - Laser methods
  - Laser annealing
  - Laser induced thermal desorption (LITD)
  - Resonance enhanced multiphoton ionization mass spectroscopy (REMPI/MS)
  - Liquid phase epitaxy
  - Magnetic measurements
  - Metastable induced electron spectroscopy (MIES)
  - Molecular beam epitaxy
  - Molecule-solid reactions
  - Molecule-solid scattering and diffraction - elastic
  - Molecule-solid scattering and diffraction - inelastic
  - Mössbauer spectroscopy
  - Neutron scattering
  - Non-linear optical methods
  - Second harmonic generation methods
  - Sum frequency generation
  - Nuclear magnetic resonance
  - Nuclear reaction analysis
  - Photoelectron spectroscopy
  - Angle resolved photoemission
  - Visible and ultraviolet photoelectron spectroscopy
  - Soft X-ray photoelectron spectroscopy
  - X-ray photoelectron spectroscopy
  - Synchrotron radiation photoelectron spectroscopy
  - Photon absorption spectroscopy
  - Extended X-ray absorption fine structure (EXAFS)
  - Infrared absorption spectroscopy
  - Near edge extended X-ray absorption fine structure (NEXAFS)
  - Photoacoustic spectroscopy
  - Visible/ultraviolet absorption spectroscopy
  - Surface extended X-ray absorption fine structure (SEXAFS)
  - X-ray absorption spectroscopy
  - Photon stimulated desorption (non-electronic)
  - Plasma processing
  - Positron spectroscopy
  - Radioactive tracer methods
  - Raman scattering spectroscopy
  - Reflection spectroscopy
  - Scanning tunneling microscopy
  - Scanning tunneling spectroscopies
  - Secondary ion mass spectroscopy
  - Solid phase epitaxy
  - Spin density waves
  - Sputter deposition
  - Surface photovoltage spectroscopy
  - Thermal desorption spectroscopy
  - Vacuum science and technology
  - Work function measurements
  - X-ray emission
  - X-ray scattering, diffraction, and reflection
  - X-ray standing waves
  - Biophysics, medical physics, and biomedical engineering
  - Bioimaging and engineering
  - Brain measurement, imaging, and instrumentation
  - Bio-inspired integrated circuits and systems
  - Neural networks and their hardware implementation
  - Bioinformatics Engineering
- (3) Phenomena**
- Adhesion
  - Adsorption kinetics
  - Atom emission
  - Atom-solid interactions
  - Auger ejection
  - Bending of surfaces
  - Catalysis
  - Charge density wave
  - Chemisorption
  - Collective excitation
  - Compound formation
  - Conductivity
  - Corrosion
  - Critical phenomena
  - Crystallization
  - Desorption induced by electron stimulation
  - Desorption induced by photon stimulation
  - Dielectric phenomena
  - Diffusion and migration
  - Electrical transport (conductivity, resistivity, mobility, etc.)
  - Electron bombardment
  - Electron emission
  - Electron-solid interactions
  - Energy dissipation

- Entangled states
  - Epitaxy
  - Etching
  - Evaporation and sublimation
  - Faceting
  - Fano resonance
  - Fermi liquid
  - Field effect
  - Field emission
  - Field evaporation
  - Field ionization
  - Fluctuation
  - Friction
  - Friedel oscillation
  - Growth
  - Hall effect
  - Interface states
  - Ion bombardment
  - Ion emission
  - Ion implantation
  - Ion-solid interactions
  - Kondo effect
  - Metal-insulator transition
  - Localization
  - Light scattering
  - Lubrication
  - Luminescence
  - Atom/ion stimulated luminescence
  - Chemiluminescence
  - Electroluminescence
  - Photoluminescence
  - Magnetic phenomena (cyclotron resonance, phase transitions, etc.)
  - Mesoscopic phenomena
  - Metastable states
  - Nucleation
  - Order-disorder phase transition
  - Order-order phase transition
  - Oxidation
  - Photochemistry
  - Photoconductivity
  - Photoelectron diffraction
  - Photoelectron emission
  - Photon emission
  - Physical adsorption
  - Piezoelectric effect
  - Plasmon
  - Positron-solid interactions
  - Quantum effects
  - Quantum conductance
  - Radiation damage
  - Schottky barrier formation
  - Second harmonic generation
  - Secondary electron emission
  - Self-assembly
  - Sintering
  - Spin density wave
  - Sputtering
  - Step formation and bunching
  - Sticking
  - Superconductivity
  - Surface chemical reaction
  - Surface diffusion
  - Surface electrical transport (surface conductivity, surface recombination, etc.)
  - Surface electronic phenomena (work function, surface potential, surface states, etc.)
  - Surface energy
  - Surface melting
  - Surface photovoltage
  - Surface relaxation and reconstruction
  - Surface roughening
  - Surface segregation
  - Surface stress
  - Surface structure, morphology, roughness, and topography
  - Surface tension
  - Surface thermodynamics (including phase transitions)
  - Surface waves
  - Acoustic waves
  - Capillary waves
  - Magnons
  - Phase transition in low dimensions
  - Phonons
  - Plasmons
  - Polaritons
  - Thermal desorption
  - Thermodynamic properties
  - Thermionic emission
  - Tomonaga-Luttinger liquid
  - Tribology
  - Tunneling
  - Vibrations of adsorbed molecules
  - Wetting
- Materials index**
- (1) ELEMENTAL AND CHEMICAL IDENTITY**  
 (Include each component of an interface or multilayer structure as a separate category.)

## Elements

- Alkali metals
- Alkaline earth metals
- Aluminum
- Antimony
- Arsenic
- Bismuth
- Boron
- Bromine
- Cadmium
- Carbon
- Cerium
- Chalcogens
- Chlorine
- Chromium
- Cobalt
- Copper
- Diamond
- Gallium
- Germanium
- Gold
- Graphite
- Hafnium
- Hydrogen atom
- Indium
- Iodine
- Iridium
- Iron
- Lanthanides
- Lead
- Manganese
- Mercury
- Molybdenum
- Nickel
- Niobium
- Nitrogen atom
- Noble gases
- Osmium
- Palladium
- Phosphorus
- Platinum
- Rhenium
- Rhodium
- Ruthenium
- Scandium
- Silicon
- Silver
- Tantalum
- Technetium
- Thallium
- Thorium
- Tin

- Titanium
- Tungsten
- Uranium
- Vanadium
- Ytterbium
- Yttrium
- Zinc
- Zirconium

## Compounds (non-molecular solids)

- Alkali halides
- Alloys
- Aluminum oxide
- Barium oxide
- Biological compounds
- Borides
- Boron nitride
- Cadmium selenide
- Cadmium sulphide
- Cadmium telluride
- Carbides
- Cobalt oxides
- Copper oxides
- Gallium antimonide
- Gallium arsenide
- Gallium nitride
- Gallium phosphide
- Gallium selenide
- Halides
- Hydrides
- Indium antimonide
- Indium arsenide
- Indium oxides
- Indium phosphide
- Inorganic compounds
- Iron oxide
- Lead telluride
- Magnesium oxides
- Mercury telluride
- Mica
- Molybdenum oxides
- Nickel carbide
- Nickel oxides
- Nickel sulphide
- Nitrides
- Silicides
- Silicon carbide
- Silicon-germanium
- Silicon nitride
- Silicon oxides
- Steel
- Sulphides

- Tin oxides
- Tin telluride
- Titanium carbide
- Titanium oxide
- Tungsten oxide
- Uranium oxide
- Vanadium oxide
- Zeolites
- Zinc oxide
- Zinc selenide

### **Molecules**

- Alcohols
- Aldehydes
- Alkanes
- Alkenes
- Alkynes
- Ammonia
- Aromatics
- Biological molecules - nucleic acids
- Biological molecules - proteins
- Carbon dioxide
- Carbon monoxide
- Carbon nanotube
- Carboxylic acid
- Cyanogen
- Deuterium
- Esters
- Ethers
- Fullerenes
- Halogens
- Hydrogen molecule
- Hydrogen cyanide
- Hydrogen sulphide
- Ketones
- Nitrogen molecule
- Nitrogen oxides
- Oxygen
- Ozone
- Phosphine
- Silane
- Sulphur dioxide
- Sulphur hexafluoride
- Water

## **(2) PHYSICAL STATE**

### **Surfaces**

- Adatom gas
- Amorphous surfaces
- Dendritic and/or fractile surfaces
- Glass surfaces
- Liquid surfaces

- Polycrystalline surfaces
- Single crystal surfaces
- Low index single crystal surfaces
- High index single crystal surfaces
- Stepped single crystal surfaces
- Vicinal single crystal surfaces
- Curved surfaces
- Surface alloy
- Surface defects
- Whiskers
- Dendrites

### **Interfaces**

- Crystalline-amorphous interfaces
- Crystalline-glass interfaces
- Electron gas
- Grain boundaries
- Liquid-gas interfaces
- Single crystal epitaxy
- Solid-liquid interfaces
- Solid-gas interfaces

### **Heterostructures**

- Heterojunctions
- Quantum wells
- Superlattices

### **Non-epitaxial thin film structures**

- Amorphous thin films
- Ceramic thin films
- Glassy thin films
- Langmuir-Blodgett films
- Polycrystalline thin films
- Adatoms
- Clusters

### **Particulate composites**

- Blacks
- Ceramics
- Powders
- Coatings
- Porous solids

## **(3) ELECTRICAL AND MAGNETIC BEHAVIOR**

### **Surfaces and/or films**

- Biosensing and devices
- Insulating films
- Insulating surfaces
- Magnetic films
- Magnetic surfaces
- Metallic films
- Metallic surfaces
- Semiconducting films
- Semiconducting surfaces
- Superconducting films

- Superconducting surfaces

### **Interfaces**

- Magnetic interfaces
- Metal-electrolyte interfaces
- Metal-insulator interfaces
- Metal-metal interfaces
- Metal-semiconductor interfaces
- Pn junction
- Schottky barrier
- Semiconductor-electrolyte interfaces
- Semiconductor-insulator interfaces
- Semiconductor-semiconductor interfaces
- Semiconductor-superconductor interfaces

### **Heterostructures and thin film structures**

- Metal-metal magnetic heterostructures
- Metal-metal magnetic thin film structures
- Metal-metal nonmagnetic heterostructures
- Metal-metal nonmagnetic thin film structures
- Metal-oxide-semiconductor (MOS) structures
- Metal-semiconductor magnetic heterostructures
- Metal-semiconductor magnetic thin film structures
- Metal-semiconductor nonmagnetic heterostructures
- Metal-semiconductor nonmagnetic thin film structures
- Semiconductor-semiconductor heterostructures
- Semiconductor-semiconductor thin film structures
- Superconductor-semiconductor heterostructures
- Superconductor-semiconductor thin film structures
- Contacts
- Rectifier
- Transistor

### **Nanostructures**

- Nano-particles, quantum dots, and supra-molecules
- Nano-wires, quantum wires, and nanotubes
- Nano-films, stacks, and other nano materials
- Nano structure chemistry, processing and fabrication
- Nano-electronics and related devices
- Magnetic, structural, and other properties of nanostructures
- Biological aspects of nano-structures
- Nano-scale imaging, measurement, and manipulation technology