

CATEGORIES

Entrants must select one category from the list below; this will determine the expertise of the initial review only.

Scholars and finalists are selected without regard to the category, and winners may not be selected proportionally across categories. Consultation with teachers or mentors is encouraged to determine the best category for each entry.

ANIMAL SCIENCES: Study of animals – ornithology, ichthyology, herpetology, entomology, animal ecology, paleontology, cellular physiology, circadian rhythms, animal husbandry, cytology, histology, animal physiology, invertebrate neurophysiology, studies of invertebrates, etc.

BEHAVIORAL AND SOCIAL SCIENCES: Human and animal behavior, social and community relationships – psychology, sociology, anthropology, archaeology, ethology, ethnology, linguistics, learning, perception, urban problems, public opinion surveys, educational testing, etc.

BIOCHEMISTRY: Chemistry of life processes – mechanisms of molecular biology and genetics, enzymes, photosynthesis, blood chemistry, protein chemistry, food chemistry, hormones, etc. Studies involve understanding life and cellular processes specifically at the molecular level.

BIOENGINEERING: Engineering principles applied to biology or medicine, such as bodily aids or replacements, medical/diagnostic devices, and drugs or other therapies using engineering to address a biological problem.

CELLULAR AND MOLECULAR BIOLOGY: Wide ranging field that studies cellular structure, function, biomolecule trafficking, signal transduction, genetic information flow, and cellular replication.

CHEMISTRY: Study of nature and composition of matter and laws governing it – physical chemistry, organic chemistry (other than biochemistry), inorganic chemistry, plastics, fuels, pesticides, metallurgy, soil chemistry, etc.

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS: Studies

that primarily focus on the discipline and techniques of computer science and mathematics as they relate to biological systems. This includes the development and application of data-analytical and theoretical methods, mathematical modeling and computational simulation techniques to the study of biological, behavioral, and social systems.

COMPUTER SCIENCE: Study and development of computer hardware, software engineering, internet networking and communications, graphics (including human interface), simulations/virtual reality or computational science (including data structures, encryption, coding and information theory), etc.

EARTH AND PLANETARY SCIENCE: Geology, mineralogy, physiography, cryosphere, ocean sciences, geomagnetism, hydrology, meteorology, climatology, speleology, seismology, tectonics, volcanology, and planetary science, etc.

ENGINEERING: Technology; projects that directly apply scientific principles to manufacturing and practical uses – civil, mechanical, aeronautical, chemical, and electrical engineering; electronic, sound, automotive, marine, heating and refrigeration, transportation, environmental engineering, etc.

ENVIRONMENTAL SCIENCE: Study of ecology, sustainability, climate, and human impacts, including pollution from air, water or land sources and their control or remediation, etc.

GENOMICS: DNA microarray and deep sequencing studies; phylogenetic analysis of DNA or other biomolecules; analysis of human or other genomes, molecular evolution, etc.

MATERIALS SCIENCE: The structure, engineering properties, processing, and innovative uses of metals/alloys, polymers, ceramics,

glasses, electronic materials, biomedical materials, composites, and other innovative materials at scales ranging from the atomic to the macroscopic, etc.

MATHEMATICS: Development of formal logical systems or various numerical and algebraic computations, and the application of these principles – calculus, geometry, abstract algebra, number theory, statistics, complex analysis, probability, etc.

MEDICINE AND HEALTH: Study of diseases and health of humans and animals – pharmacology, physiology, pathology, ophthalmology, oncology, cardiology, nephrology, endocrinology, pediatrics, dermatology, allergies, speech and hearing, nutrition, dentistry, etc.

NEUROSCIENCE: Studies of the neural basis of cognitive processes, including learning and memory, language and thought, perception, attention, and affect. It investigates the human brain, from the functional organization of large scale cerebral systems to microscopic neurochemical processes.

PHYSICS: Theories, principles, and laws governing energy and the effect of energy on matter – solid state, optics, acoustics, particle, nuclear, atomic, plasma, superconductivity, fluid and gas dynamics, thermodynamics, magnetism, quantum mechanics, biophysics, etc.

PLANT SCIENCES: Study of plant life – agriculture, agronomy, horticulture, forestry, plant taxonomy, plant physiology, plant pathology, plant genetics, hydroponics, algae, etc.

SPACE SCIENCE: Study of celestial bodies, their positions, motions, nature and evolution – astronomy, astrometry, celestial mechanics, etc.