



الخطة الوطنية للعلوم والتقنية والإبتكار

**The National Plan for Science, Technology and Innovation**

**List of Proposals sent to AAAS for September 2013 Submission**

تقنية المواد المتقدمة  
ADV Technology

Serial Number	Proposal Code	Proposal Title
1	12-ADV2688-02-R	Performance improvement of drill bits used to drill through medium-hard to hard formations for the production of natural gas.
2	13-ADV1845-02	An advanced polymeric system and a computational platform for the management of bone fractures
3	13-ADV2022-02	Development of ultra durable and ductile fiber reinforced cement based composite using ultrafines under local hot environmental conditions
4	13-ADV2160-02	Development of Ultra-high performance MgB <sub>2</sub> superconducting wires through cost-effective, scalable, and high-pressure process".
5	13-ADV2167-02	Effect of Composite Aging on the Performance of Patch Repair of Cracked Aircraft structures
6	13-ADV2179-02	Corrosion and Wear Resistant Nickel–Phosphorus based Nanocoatings for Oil and Petrochemical Applications
7	13-ADV2381-02	Versatile high aspect ratio natural products based nano/micro composite scaffolds via electrospinning for diverse biomedical applications.

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Serial Number	Proposal Code	Proposal Title
1	12-AGR2901-02-R	Applying some new integrated agronomic techniques for sustainable agriculture under water scarcity conditions
2	13-AGR1819-02	Biodiversity and Conservation of Desert Truffles in Saudi Arabia to reduce the desertification
3	13-AGR1925-02	Diversity of Spider Mites (Prostigmata: Tetranychidae) based on morphology and genetic variations in the Kingdom of Saudi Arabia
4	13-AGR1926-02	Simulation and Modeling of Engineering Properties of Dried Dates Pastes Using Solar Energy
5	13-AGR1985-02	Novel technologies for extending the shelf life of Barhi at the khalal stage of maturity
6	13-AGR2016-02	Dietary Sex preselection of Sheep Embryos
7	13-AGR2072-02	Biodiversity and Conservation of Desert Truffles in Saudi Arabia to reduce the desertification
8	13-AGR2118-02	Analysing factors contributing for natural bee forage resource base degradation and their restoration potentials in the valleys of southwest Saudi Arabia
9	13-AGR2172-02	Potential of high throughput precision phenotyping techniques for improving salt tolerance of spring wheat under field conditions

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التقنيات الحيوية

**BIO Technology**

Serial Number	Proposal Code	Proposal Title
1	11-BIO2111-02-R	Malnutrition during pregnancy and the susceptibility to develop infertility and ovarian cancer in females of new generations: morphological, histological and molecular investigations.
2	12-BIO2526-02-R	Functional analysis of salt responsive genes from saltbush
3	12-BIO2570-02-R	Utilization of Organic Wastes in the Production of Microbial Enzymes for Industrial Applications
4	12-BIO2839-02-R	Towards Domestication of Wild Olive (Oleasters) in south-western Saudi Arabia
5	12-BIO2842-02-R	Investigations into Rift Valley fever virus NSs protein interactions with host cell signalling and transcription
6	12-BIO2861-02-R	Comparative Transcriptome and Metabolome Analysis of Bitter Apple (Citrullus colocynthis) under Drought Stress
7	13-BIO1912-02	Development of an in vitro model of HIV and HBV co-infection of liver, and to study the mechanism(s) of hepatopathogenesis
8	13-BIO1986-02	Folate receptor targeted anticancer drug delivery potential of nanoparticles in cancer cells
9	13-BIO2009-02	Assessment of Advanced Tomato Breeding Lines under Drought Stress: Agronomic, Genetic and Epigenetic Changes
10	13-BIO2050-02	Shotgun De novo sequencing and draft genome assembly of the C4 halophyte grass Aeluropus litoralis : towards the cloning of the halophyte-specific genes and their promoters
11	13-BIO2129-02	Preventing the Toxicity Induced by Gold Nanoparticles and Optimizing a New Therapeutic Cancer Agent
12	13-BIO2138-02	Investigation of novel actinomycetes for antimicrobial activities and its active principles
13	13-BIO2159-02	Development and validation of surface-modified biogenic-silica based 3D tumor spheroid models for application in anticancer drug discovery
14	13-BIO2178-02	Application of Arbuscular Mycorrhizal Fungi (AMF) in phytoremediation and toxicity monitoring of heavy metals in wastewater contaminated soils in Saudi Arabia
15	13-BIO2290-02	Genetic characterization and antimicrobial profiling of marine fungi of Saudi Arabia
16	13-BIO2392-02	The impact of Vitamin D on disease activity in Crohn's disease
17	13-BIO2462-02	Improving of the reproductive efficiency of Najdi sheep using artificial insemination

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Serial Number	Proposal Code	Proposal Title
1	13-BUI1866-02	Development of a new class of corrosion inhibitor for steel reinforcement bars in concrete exposed to harsh environment of Saudi Arabia
2	13-BUI1944-02	Influence of longitudinal FRP strengthening on the shear behavior of reinforced concrete beams

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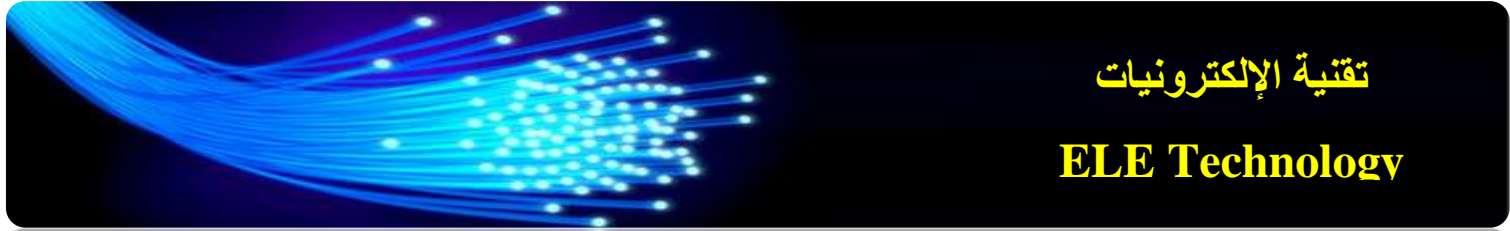
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تقنية الإلكترونيات

**ELE Technology**

Serial Number	Proposal Code	Proposal Title
1	13-ELE2040-02	23 GHz Antenna for Point-to-Point fixed Radio System for Next Generation High Speed Gbps Mobile Cellular Communications
2	13-ELE2095-02	Development and Characterization of Ultrafast Chirped Pulse Amplification (CPA) Laser System
3	13-ELE2101-02	Development of a Wideband System for Hyperthermia Treatment of Head and Neck Cancer
4	13-ELE2417-02	Smart Data Transmission and Resource Allocation Techniques for Cognitive Radio Networks
5	13-ELE2429-02	Efficient cooperative relaying scheme for Wireless Sensor Networks



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## تقنية الطاقة ENE Technology

Serial Number	Proposal Code	Proposal Title
1	11-ENE1934-02-R	Developing of Advanced Hybrid Renewable Energy Storage Techniques
2	12-ENE2927-02-R	Fuel Cell Metal Foam Humidifier
3	13-ENE1946-02	A Hierarchical Multi-agent Architecture for Automatic Restoration of Smart Grids
4	13-ENE2021-02	Fabrication and Development of High-Efficiency TiO <sub>2</sub> -Based Multilayer Thin-Film Solar Cells
5	13-ENE2030-02	Efficient Utilization of Kingdom's Industrial Waste (Sulfur) For the Design and Synthesis of Layered Metal Sulfides Nanostructures for Energy Storage Devices
6	13-ENE2034-02	Engineering of ZnO nanowire-based perovskite solar cells
7	13-ENE2087-02	Assessment of wind power and design of wind rotor for Riyadh conditions
8	13-ENE2200-02	Development of Solvothermal and Sonochemical Routes for Chalcogenide based Thin Film Solar Cells
9	13-ENE2210-02	Design and Implementation of Smart Grid for Hybrid Renewable Energy System in KSA
10	13-ENE2219-02	TOWARDS GREEN COST-EFFECTIVE DYE-SENITIZED SOLAR CELLS FOR COMMERCIALIZATION
11	13-ENE2229-02	Fabrication of ultra thin (~1 μm) CdTe solar cells with CdS:O wideband gap window layers on flexible substrates for versatile applications
12	13-ENE2432-02	Solid Dielectrics for Energy Storage Applications

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Serial Number	Proposal Code	Proposal Title
1	12-ENV2824-02-R	Probable effects of persistent organic pollutants on fertility in Saudi population
2	12-ENV3120-02-R	Synthesis of Carbon Microspheres and Hydrochar from Date Palm (Phoenix dactylifera) Biomass Wastes and Its Application for Wastewater Treatment
3	13-ENV1859-02	The Preparation of Activated Carbon from Local Agricultural Solid Waste and the Application of Activated Carbon for the Removal of Toxic Metals from Water and Liquid Waste Water
4	13-ENV2085-02	Development of pulsed fluidized bed technology for enhanced carbon dioxide capture efficiency efficiency
5	13-ENV2116-02	Toxicogenomic Investigation on Hazards of Organophosphorous Flame Retardants (OPFRs): Connections Among Genome Function, Cell Death and Carcinogenesis
6	13-ENV2233-02	Anthropogenic and natural organic matter in surface sediments from the Red Sea coast of Saudi Arabia: Multi-biomarker and geochemical applications.
7	13-ENV2350-02	Assessment of Heavy Metal (HM) Pollution in Aquatic Environment Using Fish Behavior



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تقنية المعلومات

INF Technology

Serial Number	Proposal Code	Proposal Title
1	12-INF2884-02-R	Cloud Computing and Integration of National Electronic Health Record
2	13-INF1907-02	Design of Smart wireless Camera-sensor for Low-Power Application in Wireless Multimedia Sensor Network: Image – based Object Detection, Tracking and QoS-aware Image Transmission
3	13-INF1962-02	Developing Information Assurance Governance Model, Information Assurance Assessment Framework and Toolkit
4	13-INF2010-02	Automatic Image Visualization Methodologies Using Multimodal Magnetic Resonance Imaging (MRI) For Human Heart Failure Detection and Treatment
5	13-INF2039-02	The Development of a National Anthropometric Data Bank for Saudi Adults Using 3D Body Scan Technology
6	13-INF2080-02	Cryptographically Privacy Preserving Mechanism for Cloud-based Healthcare System in KSA
7	13-INF2109-02	Using GIS in Implementation Assessment of the Innovative Alternative Intersections Approach to Reduce Traffic Congestions in Roadway Network in Riyadh city, Saudi Arabia.
8	13-INF2114-02	Image watermarking using local texture descriptors in the spatial and transform domains.
9	13-INF2136-02	Crowd Managment based on Shortlink Message Passing
10	13-INF2168-02	Enhancing Security of Fingerprint Biometrics with Heartbeat Signal for Unattended Applications
11	13-INF2203-02	Computer Aided Bus Skeleton Design (BUS-CAD)
12	13-INF2318-02	A Smart Blood Donation Social Network in KSA
13	13-INF2409-02	Scalable Processing of Graph Data Using The Power of Distributed Systems
14	13-INF2433-02	Secure and Privacy Preserving Communications in Cooperative Wireless Networks

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$$\left[ \frac{-\hbar^2}{2m} \nabla^2 + V \right] \Psi = i\hbar \frac{\partial}{\partial t} \Psi$$

برنامج الرياضيات والفيزياء  
MAT Technology

Serial Number	Proposal Code	Proposal Title
1	13-MAT1813-02	Differential equations on a Riemannian manifold
2	13-MAT2048-02	STOCHASTIC AGEING, DISTRIBUTIONAL PROPERTIES AND THEIR APPLICATIONS
3	13-MAT2111-02	Deciphering the Global Economic Downturn: Controlling Chaos in Multi-team Economic Systems
4	13-MAT2137-02	Fractional Differential Equations and their Applications
5	13-MAT2180-02	Wavelet Analysis of Directional and Anisotropic Regularities and some Applications in Real World Life

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التقنيات الطبية والصحية

**MED Technology**

Serial Number	Proposal Code	Proposal Title
1	12-MED2888-02-R	Phenotypic and functional characterization of Mucosal Associated Invariant T (MAIT) Cells in colorectal cancer patients
2	12-MED2911-02-R	Exploring the Trajectory of Spirituality and Subjective Well-being in Human Brain using fMRI
3	12-MED2934-02-R	A New Class of Metal-Based Sulfonamides as Novel Anticancer, antitumor and Carbonic Anhydrase Inhibitors, Design, Synthesis and Biological Evaluation
4	13-MED1744-02	The role of the right prefrontal cortex in binge eating disorder: a translational research study using transcranial direct current stimulation
5	13-MED1854-02	Synthesis of novel 2-oxo-N-(2-oxoindolin-3-ylidene)-2H-chromene-3-carbohydrazides as potent anticancer agents
6	13-MED1883-02	The pattern of gastroesophageal reflux and esophagitis in infants and children In Saudi Arabia
7	13-MED1908-02	Tumor suppressive role of novel siRNA nano-formulations in silencing of PI3K/HBx gene in murine carcinoma
8	13-MED1915-02	Circulating MicroRNA Expression Profiling: Potential Biomarkers in Saudi Patients with Different Types of Glaucoma
9	13-MED1947-02	Whole Genome Sequencing and Phylogenetic Analysis of Human Respiratory Syncytial Virus strains from Riyadh, Saudi Arabia
10	13-MED1948-02	Effect of Motor Vehicle Pollution on Lung Functions, Fractional Exhaled Nitric Oxide Levels and Cognitive Functions of Children and Adolescents Studying in Schools in Traffic-Congested Areas in Riyadh, Saudi Arabia
11	13-MED2029-02	Designing Tubulin Binding Drugs for Novel Chemotherapy Applications
12	13-MED2042-02	Thymoquinone activates the signaling cascade responsible

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		for hypoxic vasoconstriction in obstructive sleep apnea
13	13-MED2104-02	Treating the Cancer Disease through the Application of Different Safe and Non-Invasive Techniques
14	13-MED2113-02	Development and validation of new nutritional assessment tools for renal patients in KSA
15	13-MED2120-02	Novel Semisynthetic Quinazoline and Sulfonamide Derivatives from the Natural Alkaloid L-Norephedrine as Anticancer Agents
16	13-MED2307-02	High-Throughput screen to identify chemosensitizing microRNAs for human solid tumors
17	13-MED2341-02	Identification, characterization and in vitro evaluation of food surfactant associated-ultrafine carbonaceous particulates on human colon-, immune- and adult mesenchymal stem- cells
18	13-MED2353-02	Identification and study of the natural plant products in photo chemoprevention of skin cancer
19	13-MED2358-02	Effect of Obesity on Lung Functions, Fractional Exhaled Nitric Oxide Levels and Cognitive Functions of school-aged Saudi children and adolescents
20	13-MED2383-02	Determination of Angiotensin (1-7) Pathway Role in Osteoporotic Diabetic Bone Following Experimental Induction of Diabetes
21	13-MED2479-02	Determination of toxic substance associated with Chronic Disease in various food products in Saudi Arabia



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تقنية النانو

**NAN Technology**

Serial Number	Proposal Code	Proposal Title
1	12-NAN2625-02-R	Nano structured Organic semiconductor sensors for the measurement of ionizing radiation
2	12-NAN2871-02-R	Macro, micro and nano-durability of high performance concrete under mono and multiple aggressive environments: A key pathway towards sustainable concrete
3	13-NAN1897-02	Development and Characterization of a Novel Nano-sized Formulation for Oral Delivery of Paclitaxel
4	13-NAN1964-02	Design of novel antimicrobial herbal buccal muco-adhesive biofilms of pomegranate extract by a nanotechnological approach
5	13-NAN1967-02	Ultrafast active and nonlinear nanoplasmonics-hybrid quantum systems for nano-integrated light wave electronics
6	13-NAN2038-02	Development of advanced photoelectrodes for efficient solar H <sub>2</sub> generation using tandem cell
7	13-NAN2066-02	Investigation of room temperature nanostructured ferromagnetic semiconductors for Spintronics applications
8	13-NAN2103-02	Development of Graphene Based Metal Oxide Hybrid Nanomaterials System for Energy Storage Applications
9	13-NAN2121-02	nano devices modeling Gold Nanoparticles as a Potential Vehicle for Antisense Oligonucleotides Delivery to Regulate Gene expression and Control Ichthyophthiriosis
10	13-NAN2126-02	Synthesizing and Characterizing New Thermoluminescent Nanomaterials for Radiation Dose Measurement and Other Semiconductor Applications
11	13-NAN2367-02	Steady state vibration analysis and mitigation of nanostructures based on nonlocal elasticity theory

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Serial Number	Proposal Code	Proposal Title
1	13-PET1997-02	Development of Adsorptive-Biodesulfurization Combined System for Desulfurization of Crude Petroleum Oil and Fuels
2	13-PET2150-02	Catalytic Studies of Catecholate-type Pt/Ru Mixed-Metal Complexes Derived From Tripodal Ligands: Synthesis and Structural Characterization

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تقنية الفضاء والطيران  
SPA Technology

Serial Number	Proposal Code	Proposal Title
1	13-SPA2075-02	Application of Remote Sensing and GIS for Locating Suitable Mangrove Plantation Sites along Al-Khobar – Al Salwa strip, Arabian Gulf, Saudi Arabia
2	13-SPA2079-02	Experimental and analytical investigation of unsteady three dimensional flow interactions with high aspect ratio airfoils
3	13-SPA2117-02	Use of non-uniform plasma actuators for wing-tip vortex control with application to UAVs
4	13-SPA2149-02	Thermal and Hyperspectral Unmanned Aerial Vehicle Imaging for Precision Farming

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Serial Number	Proposal Code	Proposal Title
1	13-WAT2084-02	Nonconventional Desalination Using Freezing Technique

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