I. R. Iran
Ministry of Science Research and Technology
Iranian Research Organization for Science & Technology
(IROST)

Presented by
Dr. Ahmad Akbari
Vice Minister and
President of IROST
IROST Background

- IROST was founded in 1980, as an applied research organization.
- IROST is affiliate member of Ministry of Science, Research and Technology (MSRT)
- IROST is the center for advanced technology research, according to the potentials of country.
Objectives & Policy

- To spread awareness about the investment opportunities in:
  - Aerospace Science,
  - Biotechnology,
  - Green Chemistry Technology,
  - Nanotechnology,

- Training and help for development of technology to the entrepreneurial community,

- To outline a set of incentives and concessions for the industry to attract investment in the field of advanced technologies,

- Technology commercialization and

- Transfer of technology.
IROST Facilities

- IROST provides infrastructure as well as enhance human resources for the development of technology in IROST Incubating Technology Center.

- IROST provides an appropriate institutional and laboratory framework to achieve their objectives.
IROST Departments consists of:

- Department of Chemical Technologies
- Department of Biotechnology
- Department of Electronic & Computer
- Department of Mechanics
- Department of Advanced Material & Renewable Energies
- Department of Agriculture
- Department of Advanced Technologies
Aims & Objectives

- Regenerate workforce and to move advanced sciences from laboratory into industry.
- Develop the human resources and process to support ability of country to leverage and add value.
- Development of advanced technologies and commercialization of successful projects.
Total number of staffs: 135
Associate Prof.: 8
Assistant Prof.: 46
Researchers: 47
Assistant researchers: 35
Outline of Research & Development in IROST

- Research... Laboratory manufacturing
- Development of Technology....Consumer.
- Research... Product Development
- Manufacturing ... Marketing and Sale.
Department of Mechanics
Department of Mechanics Projects

1- Compilation of energy consumption, and energy labeling for residential fans.

2- Design and calculation of a prototype Diesel engine cycle based on DME (die methyl ether) fuel

3- Design and construction of a programmable processor for treatment of metals at low temperatures
Megatoronic Laboratory
Engine Test Laboratory
Freeze Dryer
Fully designed & made at IROST
Hot Torsion Test Machine

- Control Panel
- Inductively heated specimen
- Protected atmosphere enclosure
- Longitudinal RTL view
- Hydraulic power pack
- Longitudinal LTR view
- Induction heating furnace (RF)
- Post processing software
- Programming Software
Electro-optic targets

Shock wave supersession by FPGA programming

Micro processor translator/filter

Post processing unit

An array of laser cameras forming a laser curtain

Plexi-glass colimators and line generators used in a laser curtain maker

An FPGA based unit receiver

Shock wave (supersonic)

An array of receivers

Final test of EOT in IROST
Chemical Technologies
Department
Different processes for manufacturing of pharmaceuticals

Different processes for manufacturing of Silymarin, Ammonium Glycyrrhizinate, Hesperidin, Rutin and liquid herbal extracts

Different processes for dairy products manufacturing

Different processes for food additives manufacturing
Waster-water resources analysis, investigation to reduce the pollutants and/or hydraulic loading, waste-water sampling and analysis, pilot studies to optimize the different waste-water treatments, upgrading of the existing waste-water treatment plants.

- Natural gas conversion
- A culture promotion of scientific temper through seminars/ symposia/ workshops
- Extension of technical services to industries
- Design & Construction of multipurpose pilot plants
- Cellulosic pots pilot plant
- Mini-pilot plant for Dimethyl ether production
- Cryogenic Grinding mini-pilot plant for spices and medicinal plants
- Test Station for Polymer Exchange Membrane (PEM) Fuel cell
- Pilot Plant for Medicinal Plant Processing by Counter-Current Method
De-Methyl Ether (DME) Pilot Plant
Green Fuel!
Dental Alginate Pilot Plant
Nanotechnology
Biotechnology Department
Biotechnology Department
Research Laboratories and Facilities Includes:

- Enzyme Technology lab
- Environmental Biotechnology labs (Biodegradation & Bioremediation labs)
- Molecular Biology lab
- Protein Chemistry lab
- Extremophile Microorganism lab
- PTCC laboratories
- Mini Pilot plant and Pilot Plant Laboratories for fermentation system and recovery products.
Fermentor (3000 L)
Fully designed & made by IROST
Biotechnology Pilot Plant
Improvement of Alcohol Production in Pilot Plant Scale

![Graph showing residual sugar%, alcohol%, pH, and cell number over time.](image)
The Persian Type Culture Collection (PTCC)

- Established in 1982
- Affiliated member of WFCC since 1984, with the code PTCC 124 I.
- Regional reference center of biotechnology (Biotechnology MIRCEN) since 1992.
- Research and Training Activities for west and central Asia, Environment friendly technology.
UNESCO MICROBIAL RESOURCES CENTERS (MIRCENS) NETWORK
Persian Type Culture Collection

- Screening of wild strain from biodiversity resources of Iran for bioactive molecules.
- Collection and maintenance of industrial microorganisms from different area of Iran
- Regional Centre for deposit of Type strain.
Persian Type Culture Collection

- Training and Workshop:

- Industrial Microbiology and Fermentation Process every year

- Improvement of Industrial Microorganisms by Mutation and Selection every year

- Regional Workshop /conference on Geo-Biotechnology February 2007

- Regional Conference/ Workshop on Extreme Environment and Extremophite Organisms November 2007
The Persian Type Culture Collection (PTCC)
Biological Control of Malaria

One bite is enough...

Rice Field. KAZEROON
Bio-Flash Company

A Real Sample of Research into Industry

Nature Biotechnology Co.
Department of Electronic & Computer
The laboratories of the Electronic & Computer department

- Communication & Space Technologies Laboratories:
  - Space Technology Center (STC)
  - 1) Satellite Signal Processing & Data Center Lab
  - 2) Space Battery Lab
  - 3) Space Simulator Lab
  - 4) Solar Cell Test Bed Lab
5) Space Quality Assurance Lab

6) TMTC Lab

7) Space Software Test-bed Lab

8) Space Sensor, Monitoring and Control Lab
- Communication & Electronic Lab.
- Satellite Remote Sensing Lab.
- Energy & industrial automation group
  1) Telecommunications lab.
  2) Electronics lab.
  3) Power electric lab.
Biomedical engineering group:

1) Biomedical instruments test lab.

2) Electronics & power lab

3) Telemedicine Lab

Information technology & intelligent laboratories:

1) Artificial intelligence lab.

2) Software test lab

3) Computer networks lab
Mesbah Engineering Model

Separation switches

Electronic box mounted on a trolley

Part of the structure, Al7076 T6

Thermal subsystem

Attitude control subsystem

Specially written computer program
Mesbah mini-satellite ground model

Internal harness

Magnetic damper

Base band modulators

Thermal radiators

Fixed cross yagi antenna

Modular structure

UHF power combiner

GG boom in the deployed configuration

Tray type design
Computer Aided Design

3D model of MESBAH structure

Modal analysis - cross 20

3D model of E-box, exploded view

Launcher interface

E-box modal analysis

Launcher fairing

Static analysis

Mesbah in the working configuration
Mesbah FM, EGSE, MGSE

Integration of GG boom and batteries

Integrated EM in Clean room

Transport container

Batteries during thermal vacuum test

Integration of e-box

Mesbah ground station

Integrated without solar panels
Mesbah Satellite Integration
Mesbah Satellite Integration
Mesbah Satellite
Newly Established Laboratory

EMC Lab

Space Simulator Lab

Sun Simulator Lab
Digi-Sonde System
Upper Air Observation System

Digital Radio Sonde

Digi Mon Ground Station
Telecommunication Laboratory
Facilities

Spectrum/Network Analyzer

Digital Transmission Analyzer

Transmission /Reflection Network Analyzer
Electronic Laboratory Facilities

Electronic Load

HF Oscilloscope

Frequency Synthesizer

HF Signal Generator
Medical Engineering laboratory

Research Laboratories Facilities Includes:
Haemodialysis Machine
Fully Designed and Made by Medical Engineering Group
World Energy Policy

The 5 Pillars of International Energy Policy are:

2) Protect the Environment and step up efforts to reduce greenhouse Gas Emissions.
3) Guarantee energy at Competitive Prices.
4) Guarantee Social and Territorial Unity by ensuring energy access for all.
5) Oil overdependence and petro-fuel decline offer the world an incentive towards the discovery of renewable energy.
Energy Supply: The Shell Scenario
Sustained Growth Scenario

Source: Shell International Limited.
Advanced Materials & Renewable Energy Department

Solar Guest House
Advanced Materials & Renewable Energy Department Facilities

1-1- Material analyses laboratory
   a) Metallography laboratory
   b) Carbon- Sulfur analyzer

1-2- Moulding, Alloying and Casting Laboratory
   a) Vacuum Induction Melting Furnace (VIM)
   b) Vacuum Arc Re-melting Furnace (VAR)
Advanced Materials & Renewable Energy
Department Facilities

1-3: Surface Engineering and corrosion laboratories
   a: surface engineering laboratory.
   b: Corrosion laboratory

1-4: heat treatment laboratory

1-5: Powder Metallurgy, Magnetic and Amorphous laboratory

1.6: Solar Energy Lab.
Advanced Materials & Renewable Energy Department

Heat Pipe Solar Collector

MOSALA(MOSQUE) OF ZABOL
SOLAR HOT WATER SUPPLY
Advanced Materials & Renewable Energy Department
Department of Agriculture
Department of Agriculture has several laboratory including:

- Biocontrol Lab.
- Insect rearing and insectarium Lab
- Plant tissue culture Lab.
- Processing Lab.
- Agriculture machinery testing and evaluation Lab.
- Animal science feed Lab.
Department of Agriculture
Data Collecting Machine
Department of Agriculture

Plant Tissue Culture
Laboratory of Animal Science
Proposed Area of Cooperation

- Bio-fuels and their Application
- Renewable Energies and their Application
- Agriculture and Water-Industrial Waste Management
- Training and Capacity Building
- Space Technology and its Application Network between Centres of Excellence of COMSATS Countries
- Medicinal Plants Training, Technology Transfer, and Commercialization
Thanks for Your Attention