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Ben-Gurion University of the Negev

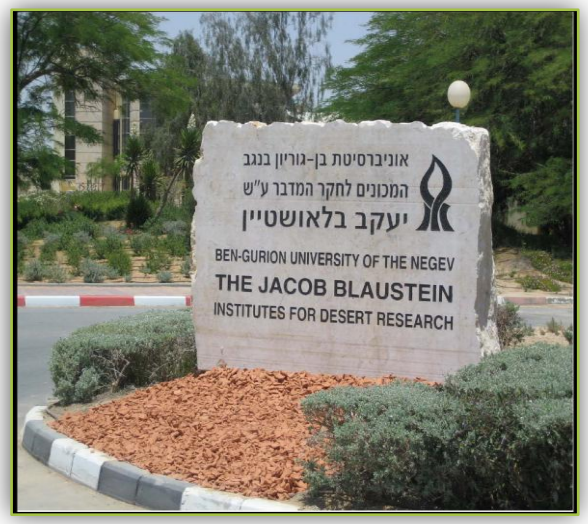
Translating basic research into commercial applications

M. Herskowitz

November 27, 2012

BGU scientists have conducted energy-related R&D for more than 3 decades

Researchers at Sede Boker and Marcus campuses have developed specific infrastructure and renowned expertise in energy R&D



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Energy R&D should be closely related to the outside world

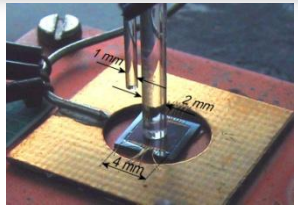
- Bridge the gap between fundamental and applied research and facilitate applications

- Be attentive to the needs of individuals, society and industry

- Promote engines for enhanced interaction between academia, industry and society

The National Solar Energy Center at BGU integrates solar energy R&D

- Concentrated Photovoltaic Systems can handle 400 kW of sunlight to intensities up to 10,000 suns
- Thermal solar systems
- Unique test lab maps PV performance
- Solar Optics gets light from source to target with minimal loss and maximum concentration
- Meteorological Data Lab
- Inorganic and organic PV cells are prepared using nanomaterials and characterized by advanced methods



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National Solar Energy Center developed technology for the Israeli ZenithSolar

News

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BGU technology fuels Israel's first solar farm

Unique system far more efficient than industry standards
By Andrew Lavin Special to The Advocate
BEER-SHEVA, ISRAEL - Zenith- Solar, an Israeli start-up company, launched its first solar farm near Tel Aviv on April 26, based on concentrated photovoltaic (CPV) systems developed by Professor David Faiman of Ben-Gurion University of the Negev.

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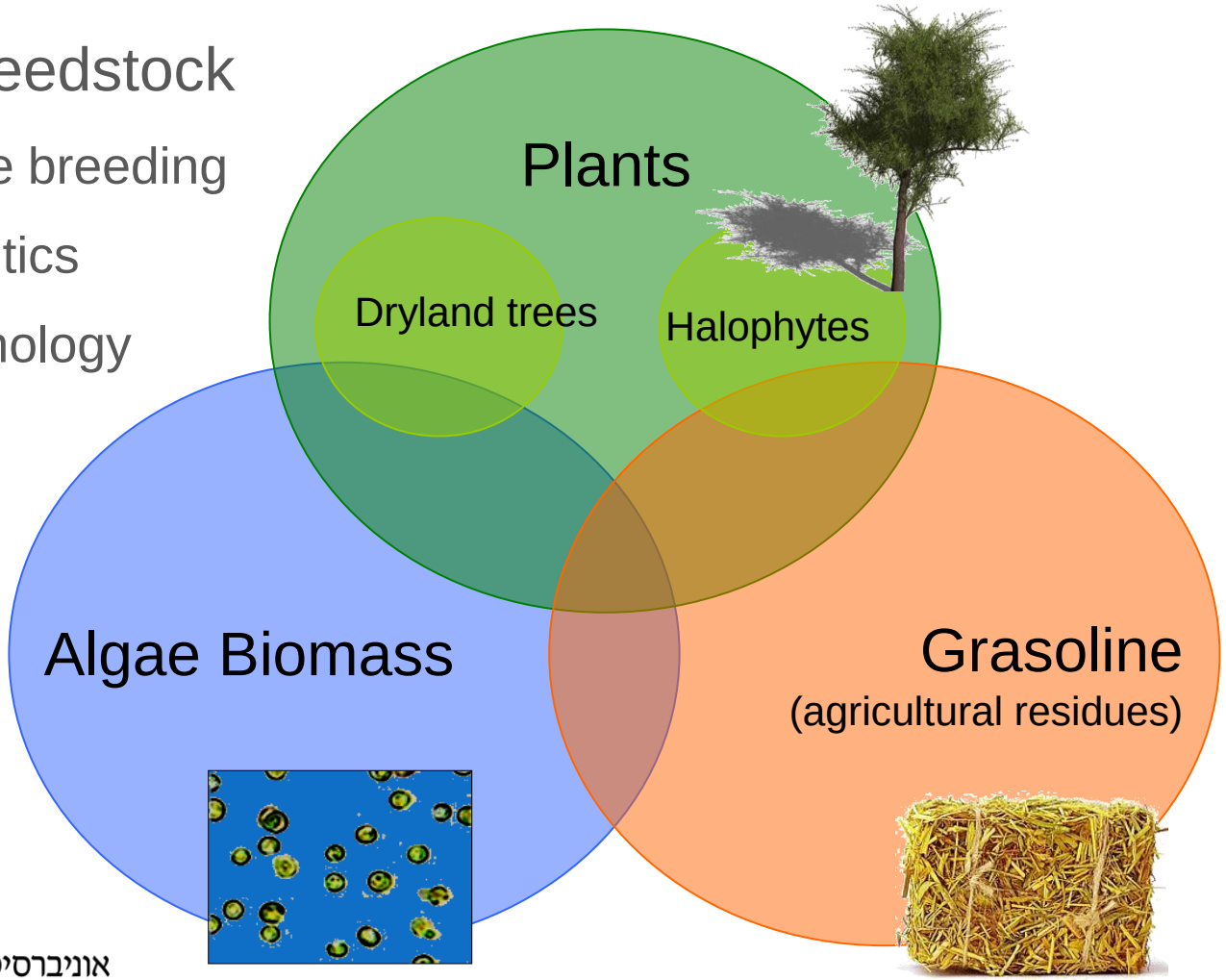
BGU is a partner of Israel Center of Excellence in Solar Liquids

- Biomass feedstock
  - Plant/algae breeding
  - Plant genetics
  - Agro-technology



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BiofuelsDigest
The world's most widely read biofuels daily

Making Algae Biodiesel at Home

January 07, 2009 | Jim Lane | Comments 0

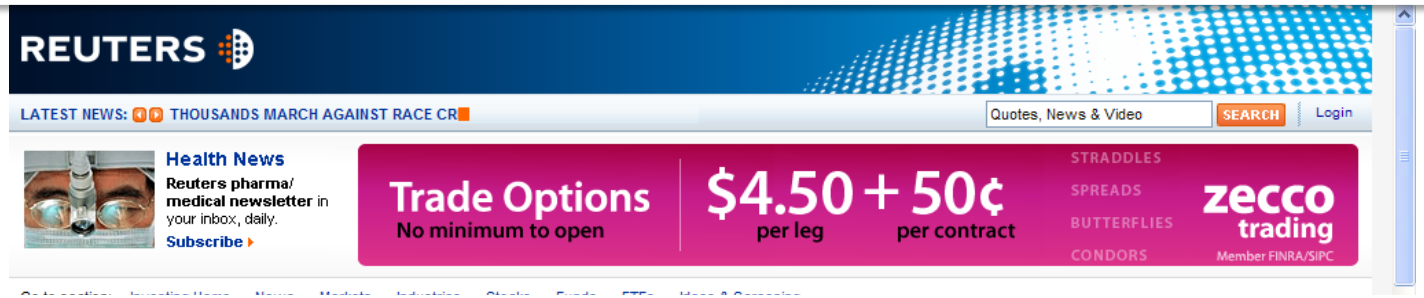
Primafuel to enter algae sector; licenses technology from Ben-Gurion University

In California, Primafuel announced that it would enter the algae production sector with a licensing agreement with Ben-Gurion University Microalgae Biotechnology Lab in Israel. The company's biorefinery technology team had previously been recognized as a Technology Pioneer by the World Economic Forum for transformational biomass processing technologies. Primafuel execs said that the company would combine upstream algae production and downstream biorefinery systems.

BGU is a partner of Israel Center of Excellence in Solar Liquids

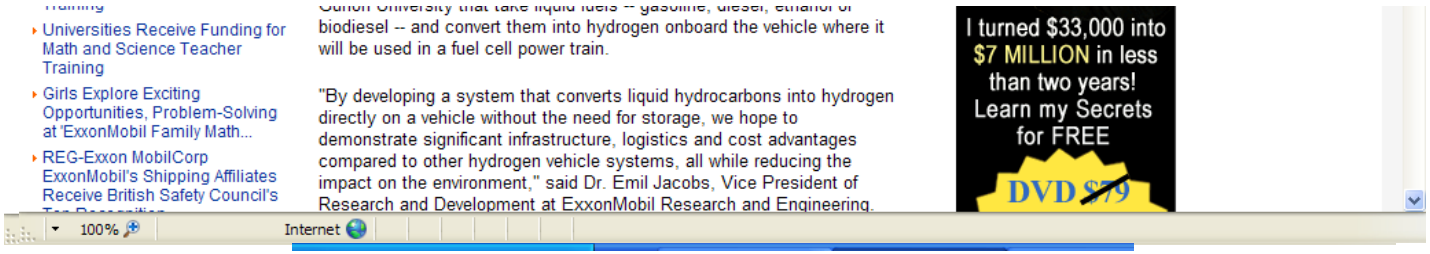
- Biomass conversion technologies
  - Combustion and gasification
  - Carbon dioxide hydrogenation to liquid fuels
- Ultra-clean fuels
  - Removal of sulfur from diesel and gasoline
- Vegetable oils to green jet-fuel and diesel
  - Novel catalysts based on research of nano-materials
  - Development of advanced processes and reactors

ExxonMobil to Work with Blechner Center on-Vehicle Fuel System



Dr. Emil Jacobs, Vice president of Research and Development at ExxonMobil Research and Engineering stated:

"There is long road ahead before this technology could be deployed on mass scale in passenger vehicles, but it has the potential to be up to 80% more fuel efficient than today's internal combustion engine technologies and reduce CO_2 emissions by up to 45% "



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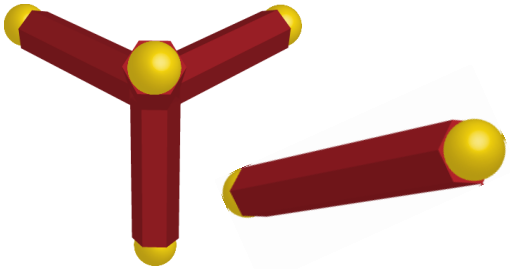
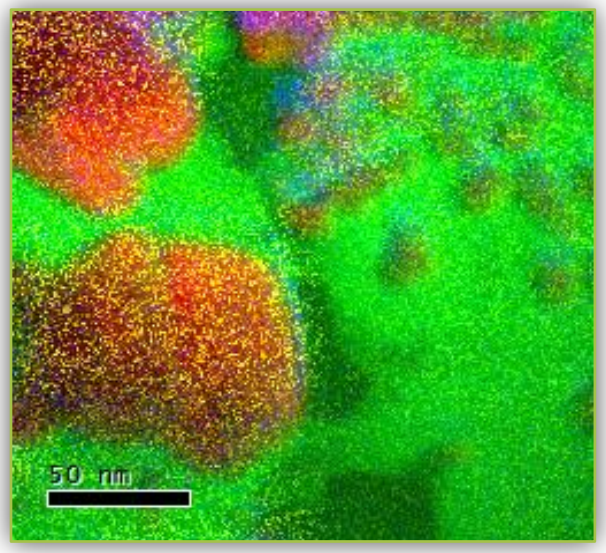
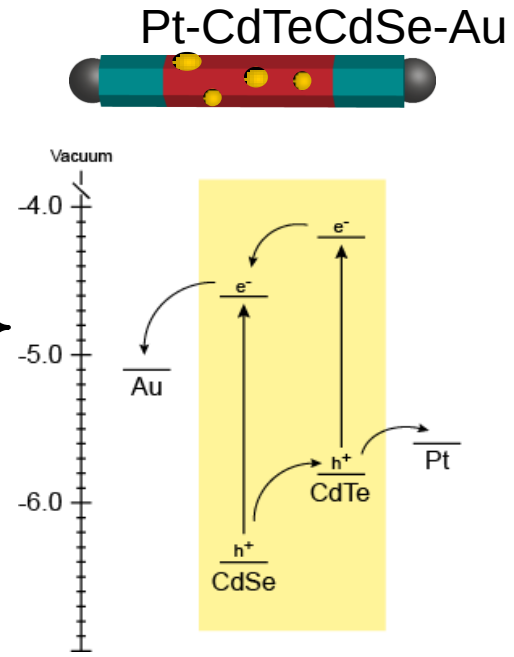
- Artificial photosynthesis
  - Water splitting to hydrogen
  - Carbon dioxide hydrogenation to liquid fuels
  - Carbon dioxide and water to liquid fuels







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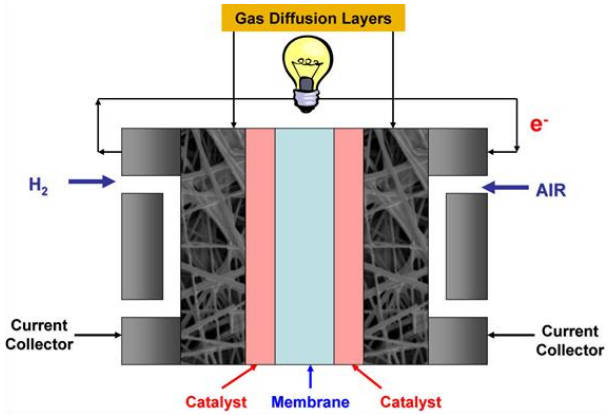
BGU researchers are active in natural gas R&D

- Scientists at the Department of Geology are tracking the formation of oil and gas in a variety of environments
  - Hydrocarbons and sulfur transformations during generation of gas and oil
  - Multiple isotope fingerprints will give unique information on biogeochemical processes in the modern aquatic systems

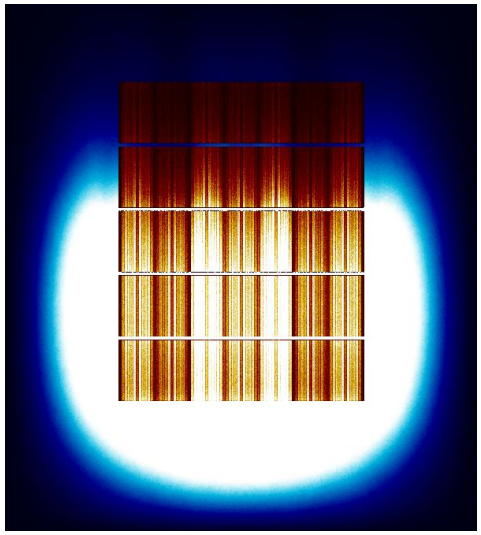
- The Blechner Center has been working for many years on natural gas related projects
  - Conversion of natural gas to chemicals and fuels

BGU Energy initiative covers a wide range of fields

- Fuel cells
  - Membrane technology and catalyst
  - Microbial biofuel cells

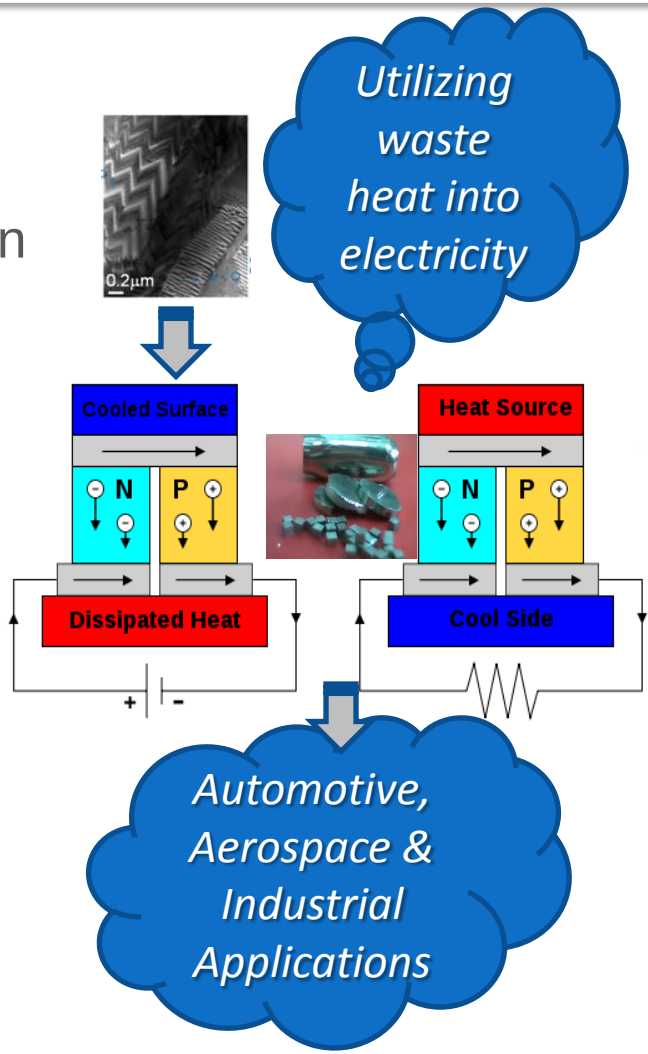


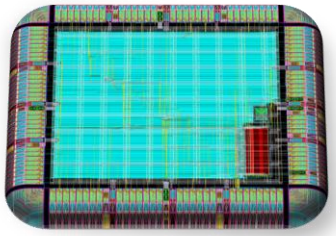
- Advanced methods for nuclear reactor modeling
  - New reactor designs
  - Optimization of nuclear fuel cycle



Energy utilization and efficiency are an important part of the BGU Initiative

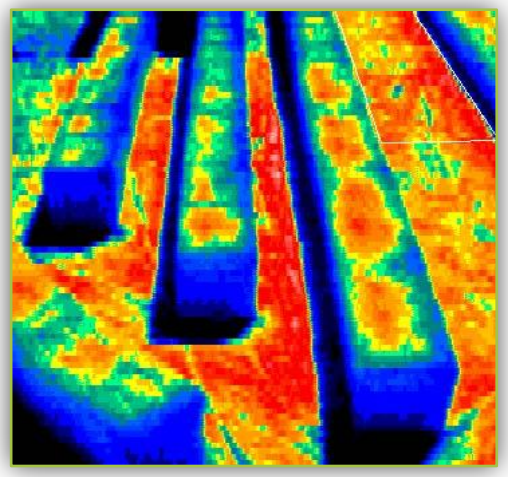
- Thermoelectricity
  - Development of devices
  - Nanostructuring & electronic optimization
  - Advanced characterization & modeling
- Energy Efficient VLSI Circuits
  - Energy efficient VLSI memories
  - Energy efficient VLSI digital design





Energy utilization and efficiency are an important part of the BGU Initiative

- Regional and urban sustainable development
  - Energy conserving, green architectural design
  - Life Cycle Energy Analysis of materials, building
  - Retrofit of existing housing stock
  - Green building Cost-Benefit Analysis



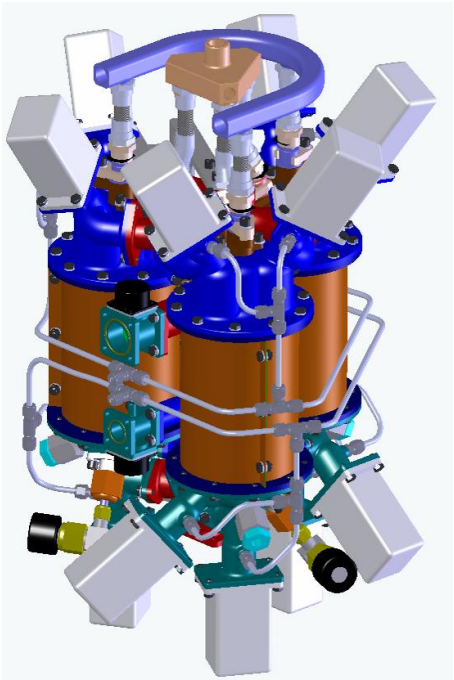
- Energy accounting and its interaction with society
  - Ecological and carbon footprint analysis
  - Energy and Society
  - Analysis of existing and emerging perceptions of energy security

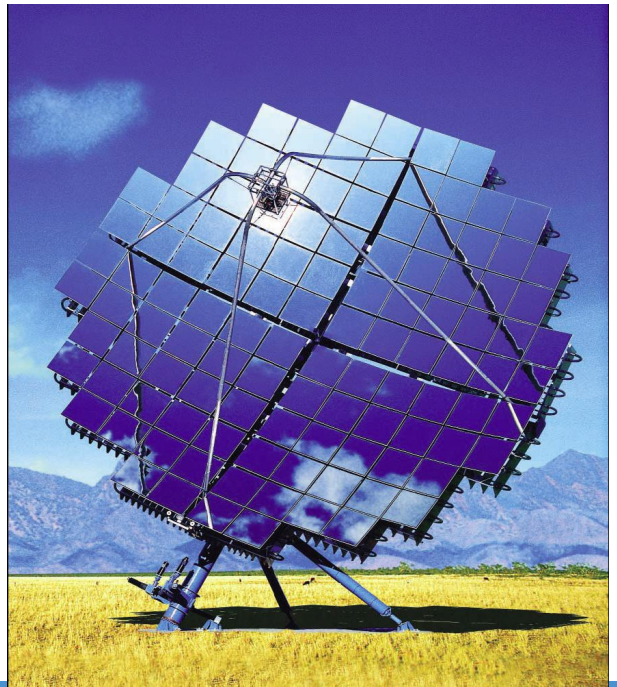
BGU has and will invest in energy related infrastructure and staff

- Over $20M will be spent over the next five year, about half from university resources and half from research grants
  - Physical infrastructure
  - Excellent faculty members in relevant research areas
  - Fellowships for graduate students and post-docs
  - Technical staff

- Undergraduate and graduate programs in energy
  - Graduate program in energy engineering
  - Undergraduate energy program in chemical engineering

Join BGU in this exciting endeavor to sustainable and attainable energy





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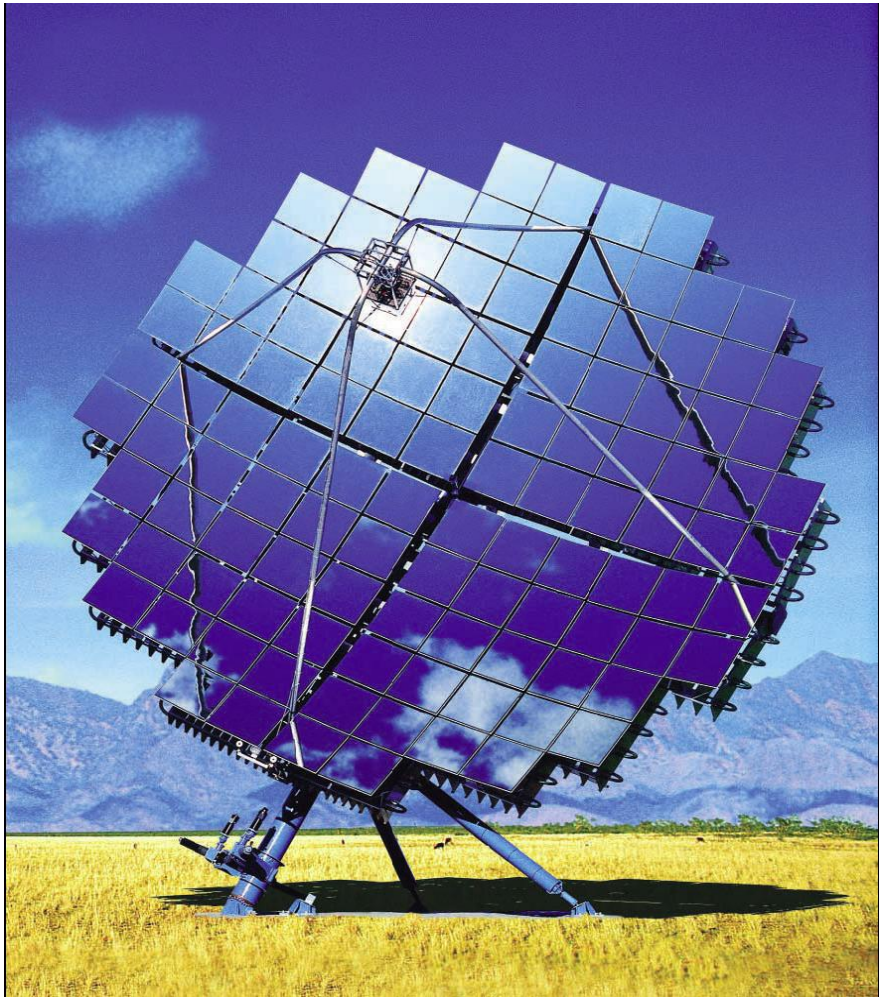

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