INNOVATIVE TECHNOLOGIES & ADVANCED RESEARCH

FOR THE AUTOMOTIVE INDUSTRY

BGN Ltd.
of Ben-Gurion University

Content

About Ben-Gurion University

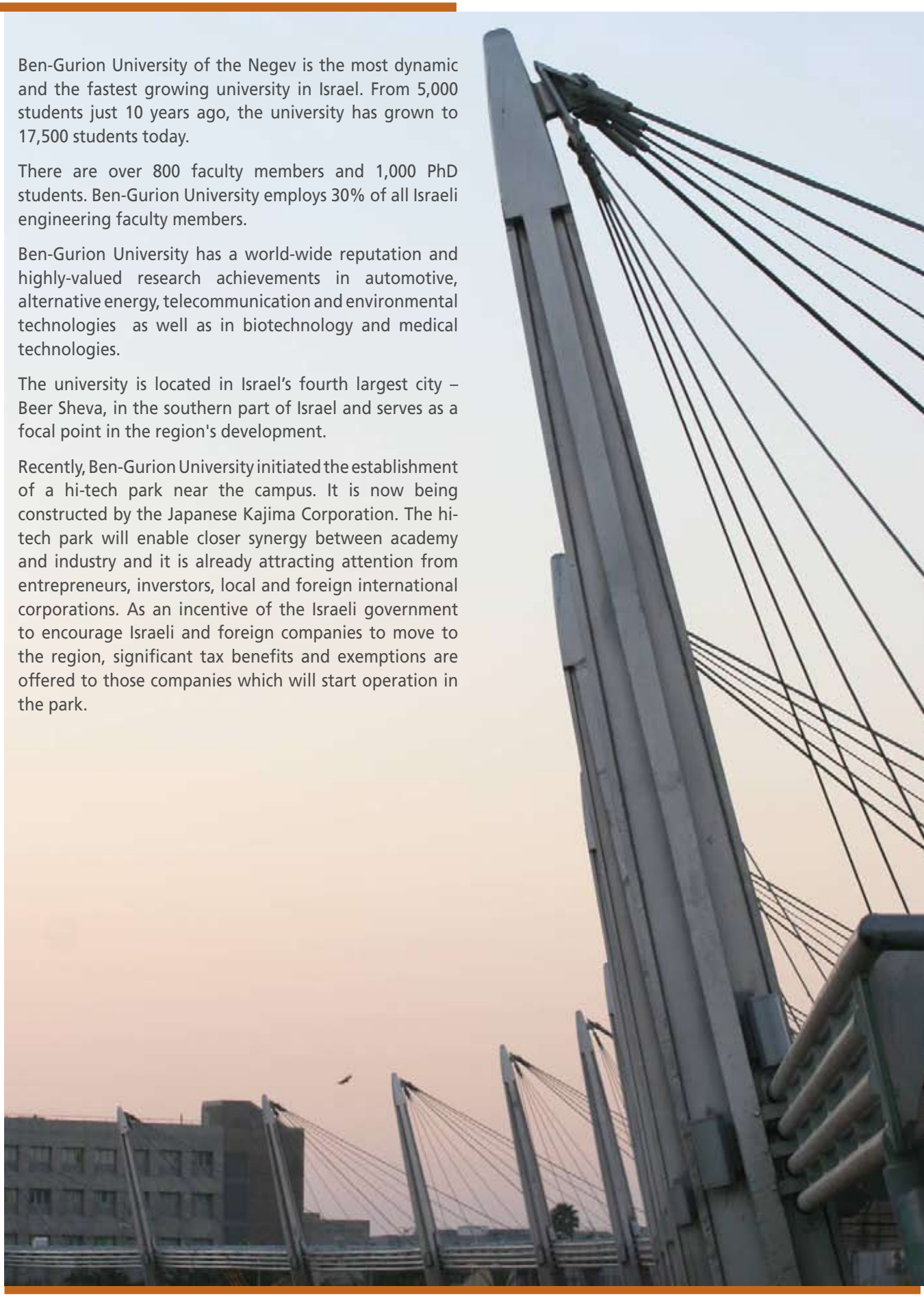
Ben-Gurion University of the Negev is the most dynamic and the fastest growing university in Israel. From 5,000 students just 10 years ago, the university has grown to 17,500 students today.

There are over 800 faculty members and 1,000 PhD students. Ben-Gurion University employs 30% of all Israeli engineering faculty members.

Ben-Gurion University has a world-wide reputation and highly-valued research achievements in automotive, alternative energy, telecommunication and environmental technologies as well as in biotechnology and medical technologies.

The university is located in Israel's fourth largest city – Beer Sheva, in the southern part of Israel and serves as a focal point in the region's development.

Recently, Ben-Gurion University initiated the establishment of a hi-tech park near the campus. It is now being constructed by the Japanese Kajima Corporation. The hi-tech park will enable closer synergy between academy and industry and it is already attracting attention from entrepreneurs, inverstors, local and foreign international corporations. As an incentive of the Israeli government to encourage Israeli and foreign companies to move to the region, significant tax benefits and exemptions are offered to those companies which will start operation in the park.



About BGN Technologies Ltd.

BGN Technologies is the Technology Transfer Company of Ben-Gurion University, continuously seeking for prospective strategic partners, licensees and investors.

Total management commitment of fast responsivenessn combined with bright researchers and cutting edge inventions, BGN Technologies makes the perfect partner for companies who seek creativity and innovation.

BGN Technologies deals with a wide range of technologies such as, energy, information technologies, communications, electronics and electro-optics, image processing and restoration, signal processing, remote sensing, biotechnology and biomaterials, nanotechnology, chemistry and chemical processes, and more.

BGN Technologies Selected Activities

BGN Technologies keeps close contact and on going communication with industrial partners in Israel and worldwide. These on going relationships often result in further research collaborations, technology transfer, joint ventures and discovery of new common interests not identified before.

Exxon-Mobil

Exxon Mobil Corporation partnered with Ben-Gurion University to commercialize an on-vehicle hydrogen production system for use in a fuel cell-powered lift truck application.

Press release - English
http://www.businesswire.com/portal/site/exxonmobil/index.jsp?ndmViewId=news_view&ndmConfigId=1001106&newsId=20071115005128&newsLang=en&vnsId=

Press release – Japanese (short version)
http://www.businesswire.com/portal/site/exxonmobil/index.jsp?ndmViewId=news_view&ndmConfigId=1001106&newsId=20071115005128&newsLang=ja&vnsId=-2147483648

Deutsche Telekom

Deutsche Telekom and Ben-Gurion University established a joint research institute, known as "Deutsche Telekom Laboratories at Ben-Gurion University". Investing $12M, Deutsche Telekom established its first R&D center outside Germany.

Press release:
http://bulletin.sciencebusiness.net/ebulletins/showissue.php3?page=/548/art/4887

Introduction of Automotive Related Technologies

Image Processing for Peripheral Monitoring

Driver's Vision Enhancement

An active imaging system originally developed by an Israeli industrial entity, Elbit Ltd, has been improved by BGN Technologies researchers in cooperation with it's original developer. In this system infrared laser pulses are used to illuminate the road ahead up to about 250-300 meters, (by far better than the 50 meters range of car headlights). The innovative techniques remove interruptions from the image and allow the road signs to be read from much greater distances using existing car headlamps. In addition, the system enables the user to see through even in adverse weather conditions such as fog, rain, snow, etc.

Research team leader:

Prof. N. S. Kopeika - Reuven and Frances Feinberg Chair, Electrical and Computer Engineering Dept.

Security - Driver Authentication, Data Security

Human Factors and Ergonomics in Driving and Highway Safety

Research facilities include the only full-size driving simulator laboratory in Israel, instrumentation for conducting physiological measurement and monitoring eye movements, and advanced computer systems for research on dynamic graphic displays. In addition to laboratory research, human factors research is also conducted in various field settings, including studies with instrumented vehicles and fleet studies to evaluate ITS in-vehicle technologies. One of the foci of Human Factors research at BGU is the study of human aspects of traffic safety and driving. This research looks at a wide range of topics including:

Headway judgments and passing behaviors to assist development of improved adaptive cruise control systems; Effects of in-vehicle driver information devices such as cell phones and navigation displays and the optimization of displays and information to minimize distraction; Research on the effects of psychoactive substances (alcohol, THC, caffeine, opiates, etc.) on vehicle control and crash likelihood; Research on the effects of fatigue on driver performance and evaluation of various fatigue countermeasures; Studies of novice drivers and older drivers, especially in the areas of hazard perception and recognition and sign comprehension.

Research team leader:

Prof. David Shinar – George Fhurt, Professor of Human Performance, Department of Industrial Engineering & Management.

Aesthetics of In-Vehicle Displays

A methodology that was developed to evaluate the aesthetics of information technology applications is being used in a study of vehicle instrument clusters. The study evaluates people's perceptions of, and reactions to, instrument cluster design and the importance of various design aspects in forming people's response to the designs. In addition the study evaluates the viability of the idea of personalized in-vehicle displays and of various forms of animating in-vehicle displays from their initial invisible state to operational state.

Research team leader:

Dr. Noam Tractinsky – Department of Information Systems Engineering.

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Machine Learning Systems / Man Machine Interface

Unmanned Ground Vehicles Platforms

LAR research concentrates in the areas of System Architecture, Sensors (Video, Sonar, Inertial, LADAR, GPS), Image Processing, Sensor Fusion, Vehicle Control, Path planning and obstacle avoidance, System Integration, Wearable Computers, MMI, Communications, and Platforms Design. The current status of this project is that it has a complete generic suit for autonomous urban and dirt road vehicles requiring a minor adjustment of the generic suit to a specific platform. Some of these technologies are strongly based on FL and NN running on RT DSP or embedded-processors and are used for adaptive control, sensor fusion, and image processing and diagnostic.

Research team leader:

Prof. Hugo Guterman, Department of Electrical and Computer Engineering.

Other technologies

Light Alloys and Composite Material Utilization and Improvements

Light weight, high strength boron-carbide armor materials. Our approach is based on a novel innovative way of manufacturing called "Reaction Bonded Boron Carbide, (RBBC)" which produces plates 100x100 mm in size. These plates have good ballistic resistance and withstand AP ammunition. Their overall ballistic resistance properties are comparable to the best RBBC plates manufactured in the US and are only slightly inferior to the hot-pressed boron carbide plates. Their main advantage lies in the lower manufacturing costs, since they require a processing temperature of below 1600°C contrary to hot pressing which is done at >2100°C.

Research team leader:

Prof. Moshe Dariel - Department of Materials Engineering.

Super Light Alloys for Structural and Energy Absorbing Applications

- **Consolidated light alloys with Nano/Sub-micron structure** - Light materials based on aluminum, magnesium and titanium alloys having nano/sub-micron microstructure posses unique mechanical, physical and corrosion resistance properties that are not accessible by conventional alloys. The proposed research aims at evaluating the prospects of such alloys as new materials for structural applications.
- **Cellular magnesium foam for special energy absorbing applications** - Super light magnesium foam introduces unique energy absorption capability that can not be obtained by regular aluminum foam. The aim of the proposed research is to develop a cost effective technology for the production of magnesium foam including in-depth characterization of its properties.

Research team leader:

Prof. Eli Aghion – Dept. of Materials Engineering

Combustion Engines and Pollution Control

Reducing emissions: In particular particulate regenerative traps, pulse corona discharge to reduce NOx emission, and fuel/water post injection, alternative fuels. Joint project with European company and other partners described below. We continue with this research in developing novel materials for NOx removal.

http://www.avl.com/wo/webobsession.servlet.go/encoded/YXBwPWJjbXMmcGFnZT12aWV3Jm5vZGVpZD00MDAwMjI2MTE_3D.html

Joint project with ExxonMobil on complete removal of sulfur from diesel fuels. The detailed information is confidential. The essential features could be presented in a future meeting. Production of second generation bio-diesel described in a pending patent application.

Research team leader:

Prof. Moti Herskowitz – Blechner Center for Industrial Catalysis and Process Development of Chemical Engineering. Faculty of Engineering Sciences.

Engine Vibration Signature Analysis for Predictive Maintenance Applications

Flash-boiling, dual-fuel, effervescent, electric-field assisted and air-assisted atomization.

http://eng2.bgu.ac.il/engineering/profile.aspx?id=jddrd#Pub7

Research team leader:

Prof. Eran Sher – Sir Leon Bagrit Professor, Department of Mechanical Engineering, The Internal combustion engine Laboratory.

Contact for Cooperation and Additional Information

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