# Generation of Giant Energy Using Nanomembranes

Abrudan, Alexandru (School: Tudor Vianu National High School of Computer Science)
Radu, Daria (School: Mihai Viteazul National College)

Nowadays, we need to find less polluting solutions to supply the society with energy. Therefore, we chose to study the properties of membranes with nanopores, that can generate electrical energy via electokinetic effects. We placed a polyimide membrane (its surface was approximately 2cm square) at the interface of two aquatic ionic solutions with different concentrations (10% and 0%). This way, the two faces of the membrane had different electric potentials. With two carbon electrodes, we captured the difference of voltage. We created a circuit formed by the membrane (source of electromotive force), wires and a resistor. We measured the current through the circuit with an ammeter and the voltage on the resistor with a voltmeter. The experiment lasted for 35 minutes. The highest electrical power provided on the resistor was 1.1407μW and it was recorded right after the two solutions were placed in the two compartments. After 35 minutes, the electrical power provided became 0.0825μW. This study showed that a meter square of polyimide nanomembrane can provide roughly 5.7035mW on the resistor. We intend to perform further experiments, with different solutions and different membranes made by different materials, to check how we could maximize the electrical energy given by this mechanism.

**Awards Won:**