

For Immediate Release



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## Using the sun to cool an office?

### AUB researchers revive ancient technique with a twist

Have you ever wondered why some buildings have cooling breezes even on the hottest days? Or, how people managed to live comfortably in this region before there was electricity for fans and air-conditioning. Our desire for windows in our homes and workspaces has created some of the problems we currently face in achieving comfortable indoor living conditions. However, few of us would choose to live in a dark, damp, albeit cool cave.

We all want windows with views in our homes and workspaces. Looking off into the distance helps us to relax. Wouldn't it be nice therefore not to have to close blinds to keep the sun from heating up the room? Thermal pane windows help with some of the heat generated by the sun but we still end up having to close the blinds and block our windows for parts of the day. Thermal pane windows are two or more pieces of glass that are sealed together with airspace between them.

In the March 2017 issue of Energy and Buildings journal, a team of mechanical engineering at the American University of Beirut (AUB) has come up with an innovative idea. Profs. Nisreen Ghadar and Kamel Ghali, working with graduate students Walid Abou Hwejj and Albert Al Touma, tested an open system where air could flow between the layers of glass.

Combining the ancient knowledge that hot air rises and water evaporation helps to lower temperatures with an understanding of Computational Fluid Dynamics (CFD) the FEA team has proposed a new model for a window design. The design was tested in the hot dry climate of Riyadh. As the sun heats the side of the building, the proposed design allows the building to respond to the change in climate by giving the hot air a narrow opening above the window to rise through; essentially, creating a thermal chimney. This movement of air draws the hot air from below the window in a continuous flow past a reservoir of water, through an open space between two pieces of glass thereby cooling the glass and lowering the amount of heat transferred through

the glass into the room. This improves the thermal comfort of the room for its occupants and has the potential to reduce energy consumption by 10%. Cooling the external surface of a window would allow you to keep the shutters open, let the light in, and continue to enjoy the view. We need new technologies that will help us to keep cool said Dr. Ghali. The Gulf and MENA regions will be hit hard by the effects of global warming.

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**Note to Editors**

### **About AUB**

Founded in 1866, the American University of Beirut bases its educational philosophy, standards, and practices on the American liberal arts model of higher education. A teaching-centered research university, AUB has more than 700 full-time faculty members and a student body of about 8,500 students. AUB currently offers more than 130 programs leading to bachelor's, master's, MD, and PhD degrees. It provides medical education and training to students from throughout the region at its Medical Center that includes a full-service 420-bed hospital.

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