



# Defense Technology Monitor No. 76

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**Related Categories:** Democracy and Governance; Science and Technology; China; Israel

## GUARDING THE GRID

The threat of electromagnetic pulse (EMP), resulting from either a high-altitude nuclear detonation or naturally occurring from solar flares, is both real and enduring. A major EMP event could have the devastating effect of frying large transformers and crippling the American electric grid. However, Sandia National Laboratories is working on a solution that could guard against the threat. The device is a diode that can limit a surge of power by shunting excess electricity in a few billionths of a second (similar to a plumbing valve that regulates water flow). The diode is currently capable of operating at up to 6,400 volts, but the goal is to increase resistance to 20,000 volts, since most grids function at 13,000 volts. (*Science Daily*, March 15, 2022)

## ISRAEL'S NEW SKY SENSOR

Iranian-built drones and missiles have long complicated life for defense planners in Israel. However, the recent delivery of "Sky Dew," a massive balloon with a radar-based sensor package capable of detecting incoming threats, is a welcome development. According to Moshe Patel, the director of Israel's Missile Defense Organization, "this aerostat system will cruise at high altitudes and provide an exceptional multi-directional detection capability against advanced threats." The new aerostat was developed in coordination with the U.S. Missile Defense Agency, and built to help maintain Israel's regional "qualitative military edge." (*The Times of Israel*, March 23, 2022)

## QUANTUM SUPERCHARGERS?

The threat of climate change and advances in battery technology have galvanized a trend toward electronic vehicles. But one drawback of the advanced autos is the time required to charge the vehicles — with home charging lasting about 10 hours, and at least half-an-hour required to charge via a rapid charging station. All of that may be changing, however, with quantum technology potentially decreasing charging times for electric vehicles to just three minutes. A new paper from the Institute for Basic Science (IBS) theorizes that a "global charging protocol" could enable all battery cells to be charged simultaneously through quantum engagement. Conventionally, each of the 200 cells within a typical electric vehicle need to wait their turn, but the paper argues that the charging times will be cut down dramatically if the quantum technology to do so is developed. (*Futurism*, March 23, 2022)

## A CHINESE MICROWAVE MACHINE

China has been bolstering its arsenal of space weapons for years — a buildup highlighted most recently by its low orbit hypersonic weapon test last August. In a further development, PRC scientists have now created a Relativistic Klystron Amplifier (RKA) that can generate a 5-megawatt wave burst capable of jamming or destroying satellites in space if mounted on a satellite. The directed energy weapon works by attacking the sensitive electronics aboard space systems. Though China denies the RKA microwave machine is a weapon, if built to scale it could be capable of searing through satellites components shielded by metal and traveling at high speeds. (*Business Standard*, March 19, 2022)

## AUTOMATED TRIAGE COMING SOON?

Immediately following a catastrophic event, it is imperative for authorities to quickly prioritize treatment for the injured. However, making decisions that impact whether an injured person lives or dies can be very difficult. For years, the U.S. and the NATO alliance have been operating under an outdated medical triage process — one that may now be in for an upgrade. The Defense Advanced Research Projects Agency (DARPA) recently began a new program, dubbed "In the Moment," to develop decision-making AI on the battlefield. When implemented, the system is meant to assess a mass casualty situation along multiple factors (including available resources from local hospitals) to help calculate the path for maximizing treatment. The system is meant to emulate top triage human experts, but eliminate any bias and find optimal solutions that humans are not able to because they lack the amount of inputs a computer can handle.

The methodology is not without controversy, however. Researcher Sally A. Applin cautions against allowing a machine to dictate life, stating, "we know there's bias in AI; we know that programmers can't foresee every situation; we know that AI is not social; we know AI is not cultural... It can't think about this stuff." (*Washington Post*, March 29, 2022)