The future for our Society is bright if we only know where to look. Our community sits right at the intersection of engineering and technology: between real-world applications and the basic sciences. Hence, our community is where two streams of ideas meet: one rooted in real-world needs and the other inspired by recent developments in the sciences and mathematics. New technologies and ideas are emerging out of the most unexpected nooks and crevices of the minds of our members.

Take, for instance, the field of small antenna design. Engineers are creatively coming up with smaller antennas, tucked into smaller spaces, with tighter technical specifications, due to real-world needs, e.g., from the smartphone industry (in nano-optics, Yagi-Uda antennas array are again used). The insatiable demand for higher data rates calls for fifth-generation smartphones, which further increases its prowess. We have in our pockets the supercomputers of yesteryears, further vested with incredible communication bandwidth. Even though our community is not involved with the design of every component, we are involved with the design of many of its critical components.

If we look deeper into the inner core of the cell phone, modern computer chips involve nanometer-dimension transistors—a few billion of them. The injection and extraction of data from the chips call for advanced computational electromagnetic knowledge: the modeling of global interconnects, through silicon vias and laminated media, and wireless telemetry that requires the analysis of anisotropic media.

Advances in biomedical sciences and engineering inspired new work in our area, such as optogenetic engineering, stimulation of the vagus nerve for healing, and the use of hoards of biomedical implants for extended health care. Many of these technologies need synergy with electromagnetic technology.

If we look for technologies inspired by mathematics and sciences, we notice that scientists working on topological insulators are solving Maxwell’s equations with photonic crystals as their test bed for novel ideas. Nanotechnology spawns a new field of nano-optics where solutions of Maxwell’s equations are indispensable. Microwave photons have just recently been measured, underscoring the importance of electromagnetic technology in the quantum world as well.

Researchers are toying with time-varying systems, unlocking new dimensions for technology innovation. Design spaces for engineers are greatly enlarged because of creative ideas emerging in our community. Because we need to solve Maxwell’s equations for increasingly demanding technologies, computational electromagnetics will endure to meet our demand.

I could ramble on and on, and the list of new names is long:

- quantum communications
- quantum computing
- autonomous vehicles
- non-Foster elements
- topologically protected surface states
- metamaterials
- metasurfaces
- bandgap structures
- time-reversal symmetry breaking systems
- bioimplants
- wireless power transfer.

None of these concepts can exist without synergy with electromagnetic technologies.

What about green technologies for a sustainable planet? Wind farms, solar panels, environmental remediation through electrophoresis, environmental monitoring via remote sensing—electromagnetic technologies are again indispensable. We have a bright future ahead of us!