Editorial

Nuggehalli M. Ravindra PhD
New Jersey Institute of Technology, Newark, NJ, USA

This year marks the 170th Birthday of Thomas Alva Edison.¹ With 1093 patents, held singly or jointly,² Edison epitomized creativity, invention and entrepreneurship. This year also marks the demise of Russian-American physicist and Nobel Prize winner, Alexei Abrikosov³ (superconductors, superfluids), German physicist, Heinz Billing⁴ (laser interferometric gravitational wave detector, computer systems, data storage), Dutch-American physicist and Nobel Prize winner, Nicolaas Bloembergen⁵ (laser spectroscopy), German-American physicist and Nobel Prize winner, Hans Georg Dehmelt⁶ (electron magnetic moment, *g*-factor), Russian physicist and mathematician, Ludvig Faddeev⁷ (quantum mechanical treatment of three-body problem, quantum field theory), American information scientist and chemist, Eugene Garfield⁸ (Science Citation Index (SCI)), and British physicist and Nobel Prize winner, Sir Peter Mansfield⁹ (magnetic resonance imaging).

Since the launch of SCI in 1964, it has now expanded to a larger version – Science Citation Index Expanded (SCIE).¹⁰ SCI continues to evolve and has been a focus of several studies in information science and technology.^{11–17}

One of the many privileges of practicing materials science and engineering is the ability to address and appreciate a variety of problems and implement solutions to these problems. In research and development across the world, the emphasis from materials to device to structures and systems is on the rise. These include (a) hydrogen production,^{18,19} (b) energy conversion and storage,^{20–23} (c) wearable electronics with embedded sensors^{24,25} and (d) drug delivery.²⁶

Light matter interactions are particularly interesting at the nano-scale.²⁷ In addition to applications in passive components such as optical coatings, filters and lenses, and active devices such as detectors, light-emitting diodes, optoelectronic integrated circuits, photonic crystals, solar cells and solid-state lasers, they are also critical in communications.²⁸ Optical properties of materials can be tailored by utilizing smart patterned surfaces^{29,30} as well as coatings.³¹

Recently, a combination of photo-switching dopants and organic phase-change materials has been shown to result in long-term storage and release of thermal energy in phase-change materials.³² Natural evaporation has been demonstrated to have the potential to be a reliable energy source.³³

Silicon photonics³⁴ and light emission in silicon³⁵ continue to be of interest to researchers. Colloidal CsPbI₃ quantum dot arrays³⁶ and bioinspired nanostructures of hydrogenated amorphous silicon (a-Si:H)³⁷ have been reported to yield high-efficiency solar cells and increased light absorption, respectively. Molecular magnets³⁸ and single-atom magnets³⁹ continue to drive interest for potential applications in high-density storage.

The editor joins the Institution of Civil Engineers (ICE) in congratulating Mazhar ul Haq and Zhao Gang of the Department of Mechanical and Electrical Engineering, Harbin Engineering University, Heilongjiang, People's Republic of China, on winning the 2017 ICE Publishing Awards – Emerging Materials Research Best Paper Award for their paper 'Ionic polymer–metal composite applications'.⁴⁰

The present issue contains twenty-eight peer-reviewed papers representing various inter-disciplinary subjects in materials science and engineering. The editor is thankful to the authors, readers, reviewers and the members of the Editorial Board for their contribution and support. He wishes them a very happy and prosperous new year.

REFERENCES

1. Biography.com Editors (2017) *Thomas Edison Biography.com*. See <https://www.biography.com/people/thomas-edison-9284349> (accessed 30/11/2017).
2. History.com Staff (2017) *Thomas Edison*. See <http://www.history.com/topics/inventions/thomas-edison> (accessed 30/11/2017).
3. Nobel Media (2017) *Alexei Abrikosov – Facts*. See https://www.nobelprize.org/nobel_prizes/physics/laureates/2003/abrikosov-facts.html (accessed 30/11/2017).
4. Max Planck Institute for Astrophysics (2017) *Obituary to Heinz Billing*. See <http://www.mpa-garching.mpg.de/403839/news-20170110> (accessed 30/11/2017).
5. Nobel Media (2017) *Nicolaas Bloembergen – Facts*. See https://www.nobelprize.org/nobel_prizes/physics/laureates/1981/bloembergen-facts.html (accessed 30/11/2017).
6. Nobel Media (2017) *Hans G. Dehmelt – Biographical*. See https://www.nobelprize.org/nobel_prizes/physics/laureates/1989/dehmelt-bio.html (accessed 30/11/2017).
7. Faddeev (2017) *Biography*. See <http://faddeev.com/en/biography/> (accessed 30/11/2017).
8. Wouters P (2017) *Obituary. Eugene Garfield (1925–2017)*. See <https://www.nature.com/articles/543492a> (accessed 30/11/2017).

9. Nobel Media (2017) *Sir Peter Mansfield – Biographical*. See https://www.nobelprize.org/nobel_prizes/medicine/laureates/2003/mansfield-bio.html (accessed 30/11/2017).
10. Testa J (2016) *Journal Selection Process*. See <https://clarivate.com/essays/journal-selection-process> (accessed 30/11/2017).
11. Clarivate Analytics (2017) *Emerging Sources Citation Index*. See http://wokinfo.com/products_tools/multidisciplinary/esci/ (accessed 30/11/2017).
12. Flatt JW, Blasimme A and Vayena E (2017) Improving the measurement of scientific success by reporting a self-citation index. *Publications* **5**(3): 20, <http://dx.doi.org/10.3390/publications5030020>.
13. Noruzi A (2016) Impact Factor, h-index, i10-index and i20-index of Webology. *Webology* **13**(1): 1–4. See <http://www.webology.org/2016/v13n1/> (accessed 30/11/2017).
14. Pal A and Ruj S (2015) CITE_X: A new citation index to measure the relative importance of authors and papers in scientific publications. *ICC 2015 – 2015 IEEE International Conference on Communications*, <http://dx.doi.org/10.1109/ICC.2015.7248495>.
15. Wan X and Liu F (2014) Are all literature citations equally important? Automatic citation strength estimation and its applications. *Journal of the Association for Information Science and Technology* **65**(9): 1929–1938.
16. Gupta BM, Jha AK and Mishra PK (2004) Citation indexes and other products of ISI. *Annals of Library and Information Studies* **51**(1): 1–10.
17. Chandler HE and Roper V de P (1991) Citation indexing: uses and limitations. *The Indexer* **17**(4): 243–249.
18. Ling T, Yan D-Y, Wang H et al. (2017) Activating cobalt(II) oxide nanorods for efficient electrocatalysis by strain engineering. *Nature Communications* **8**: 1509.
19. Yao X, Wang D, Zhao X et al. (2017) Scale-up of BiVO₄ photoanode for water splitting in a photoelectrochemical cell: issues and challenges. *Energy Technology*, <http://dx.doi.org/10.1002/ente.201700619>.
20. An W, Li J, Ni J, Taylor RA and Zhu T (2017) Analysis of a temperature dependent optical window for nanofluid-based spectral splitting in PV/T power generation applications. *Energy Conversion and Management* **151**: 23–31.
21. Vittorini D, Castellucci N and Cipollone R (2017) Heat recovery potential and electrical performances in-field investigation on a hybrid PVT module. *Applied Energy* **205**: 44–56.
22. Shabangoli Y, Rahmanifar MS, El-Kady MF et al. (2017) An integrated electrochemical device based on earth-abundant metals for both energy storage and conversion. *Energy Storage Materials*, <http://dx.doi.org/10.1016/j.ensm.2017.09.010>.
23. Li W and Hao Y (2017) Explore the performance limit of a solar PV – thermochemical power generation system. *Applied Energy* **206**: 843–850.
24. Miyamoto A, Lee S, Cooray NF et al. (2017) Inflammation-free, gas-permeable, lightweight, stretchable on-skin electronics with nanomeshes. *Nature Nanotechnology*, <http://dx.doi.org/10.1038/nnano.2017.125>.
25. Ayari T, Bishop C, Jordan MB et al. (2017) Gas sensors boosted by two-dimensional h-BN enabled transfer on thin substrate foils: towards wearable and portable applications. *Scientific Reports*, <http://dx.doi.org/10.1038/s41598-017-15065-6>.
26. Lefnaoui S, Moulai-Mostefa N, Yahoum MM and Gasmi SN (2017) Design of antihistaminic transdermal films based on alginate-chitosan polyelectrolyte complexes: characterization and permeation studies. *Drug Development and Industrial Pharmacy*, <http://dx.doi.org/10.1080/03639045.2017.1395461>.
27. Baranov DG, Zuev DA, Lepeshov SI et al. (2017) All-dielectric nanophotonics: the quest for better materials and fabrication techniques. *Optica* **4**: 814–825.
28. Bello F, Page AF, Pusch A et al. (2017) Combining ϵ -near-zero behavior and stopped light energy bands for ultra-low reflection and reduced dispersion of slow light. *Scientific Reports*, <http://dx.doi.org/10.1038/s41598-017-08342-x>.
29. Athanasopoulos N and Siakavellas NJ (2017) Smart patterned surfaces with programmable thermal emissivity and their design through combinatorial strategies. *Scientific Reports*, <http://dx.doi.org/10.1038/s41598-017-13132-6>.
30. Athanasopoulos N and Siakavellas NJ (2015) Programmable thermal emissivity structures based on bioinspired self-shape materials. *Scientific Reports* **5**: 17682, <http://dx.doi.org/10.1038/srep17682>.
31. Honnerová P, Martan J, Veselý Z and Honner M (2017) Method for emissivity measurement of semitransparent coatings at ambient temperature. *Scientific Reports*, <http://dx.doi.org/10.1038/s41598-017-01574-x>.
32. Han GGD, Li H and Grossman JC (2017) Optically-controlled long-term storage and release of thermal energy in phase-change materials. *Nature Communications*, <http://dx.doi.org/10.1038/s41467-017-01608-y>.
33. Cavusoglu AH, Chen X, Gentine P and Sahin O (2017) Potential for natural evaporation as a reliable renewable energy source. *Nature Communications*, <http://dx.doi.org/10.1038/s41467-017-00581-w>.
34. Bendayan M, Sabo R, Zolberg R et al. (2017) Electrical control simulation of near infrared emission in SOI-MOSFET quantum well devices. *Journal of Nanophotonics* **11**(3): 036016, <http://dx.doi.org/10.1117/1.JNP.11.036016>.
35. Pleššina JV, Đerek V, Francaviglia L et al. (2017) Nanoporous silicon tubes: the role of geometry in nanostructure formation and application to light emitting diodes. *Journal of Physics D: Applied Physics* **50**(26): 265101, <http://dx.doi.org/10.1088/1361-6463/aa7196>.
36. Sanehira EM, Marshall AR, Christians JA et al. (2017) Enhanced mobility CsPbI₃ quantum dot arrays for record-efficiency, high-voltage photovoltaic cells. *Science Advances* **3**(10): eaao4204, <http://dx.doi.org/10.1126/sciadv.aao4204>.
37. Siddique RH, Donie YJ, Gomard G et al. (2017) Bioinspired phase-separated disordered nanostructures for thin photovoltaic absorbers. *Science Advances* **3**(10): e1700232, <http://dx.doi.org/10.1126/sciadv.1700232>.
38. Goodwin CAP, Ortu F, Reta D, Chilton NF and Mills D (2017) Molecular magnetic hysteresis at 60 kelvin in dysprosocenium. *Nature* **548**: 439–442.
39. Natterer FD, Yang K, Paul W et al. (2017) Reading and writing single-atom magnets. *Nature* **543**: 226–228.
40. Haq MU and Gang Z (2016) Ionic polymer–metal composite applications. *Emerging Materials Research* **5**(1): 153–164, <https://doi.org/10.1680/jemmr.15.00026>.