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The above-mentioned cases represent the tip of the iceberg. Anyone who has dual citizenship or is a doctoral student residing or studying in another country is taking serious chances when returning to Iran for a professional or family visit. Although the US sanctions contribute to the hardships experienced by our Iranian colleagues, the actions of the Islamic Revolutionary Guard Corps are largely responsible for making the lives of the Iranian scientists miserable.

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More whiffs of the aromatic universe

Authors Alessandra Candian, Junfeng Zhen, and Xander Tielens ("The aromatic universe," PHYSICS TODAY, November 2018, page 38) give us a glimpse of the remarkable progress made by astrophysicists and astronomers in identifying carbon-based molecules found in the interstellar medium. That progress includes the identification of a subset of the diffuse interstellar band, one of the most enduring astrophysical riddles.

In addition to the emission of IR vibrational radiation and absorption across the visible spectrum into the UV, polycyclic aromatic hydrocarbon (PAH) molecules can also emit radiation from thermally populated excited electronic states. That radiation can have an important stabilizing effect on the molecules. The effect, predicted by Abraham Nitzan and Joshua Jortner in 1979, has been observed in several molecules, including fullerenes in which the radiation was seen to be enhanced two orders of magnitude or more relative to purely vibrational cooling.[1]

Also, the hydrogen-containing PAH molecule anthracene was identified as a radiator,[2] and thermally emitted photons have been measured[3] from pure carbon clusters as small as C_4^- and C_6^-. The large disparity in cooling rates for C_4^- and C_6H^- also illustrates the extreme variation caused by seemingly very small differences in molecular composition.[4] At excitation energies in which radiation competes with electron emission from those species, the photon-emission rate constants are $8 \times 10^4\ s^{-1}$ for C_4^-, for example,[5] and the energies removed (1.34 eV and 2.71 eV for the two allowed transitions) are an order of magnitude higher than vibrational quanta. Such extreme molecule-specific radiative cooling translates into strongly varying molecular survival probabilities after photoexcitation and may have significant implications for the populations of fullerenes, PAH molecules, and other molecules in interstellar space.

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The aromatic infrared bands (AIBs) discussed by Alessandra Candian, Junfeng Zhen, and Xander Tielens were discovered in interstellar and circumstellar environments in the 1970s. Since then, their origin has been a topic of interest. The hypothesis advanced by