The photophysics of solution processable semiconductors for applications in optoelectronic devices

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Propositions

accompanying the dissertation

The Photophysics of Solution-Processable Semiconductors for Applications in Optoelectronic Devices

1. The best way to properly gain the full benefits of diversity in academia is to pursue inclusion actively; it does not occur spontaneously.

2. Adding high-ε_r quantum dots to a polymer:fullerene blend suppresses the recombination of charge transfer states. The final goal would be to efficiently collect the "saved" charge carriers in a working device.

3. Incorporating ferroelectric polymers into blends of semiconducting ones appears to be more useful for applications in memory storage than in photovoltaics.

4. The prevalence of the "light-soaking effect" in planar perovskite solar cells demonstrates once again that rational choice of materials and optimized processing is a necessity for properly working devices.

5. Perovskite-shelled quantum dots combine both the exceptional optical properties of quantum dots and perovskites. While we know a lot about both types of materials, we still have a lot to learn.

6. Semantics are important in science, but even more so in matters related to our existence: "Saving the planet" simply doesn't carry the same weight as "saving ourselves".

7. Research at the frontiers of science consists of multitudes of experiments that are approximately right; and a few that are exactly wrong. Unfortunately, a few exactly wrong ones can undo decades of incremental advances.

8. We have a responsibility to (re)examine our opinions and ideas whenever we encounter new information, and especially when it contradicts them. Neglecting that obligation should be considered irresponsible conduct.

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