

Honors Topic Assignment #6- Materials meet light and heat

Due Friday March 13th

Please read this article on "[Carbon Nanotubes](#)" from nanowerk and then read this article on the blackest material, "[MIT engineers develop the blackest black material](#)". After reading about the blackest black material please read this [article](#) on the whitest white material, if you want you can also read the [scientific paper](#). Next watch this [video](#) and read this [article](#) on how solar panels (photovoltaic cells) work). Finally read this NASA [article](#) and watch the embedded videos on the heat shield on the Parker Probe

After reviewing these resources please answer the following questions in a reflection. You can answer the questions individually or write them as a short reflection essay. Please make sure to use complete sentences as well as correct spelling and grammar.

Feel free to discuss your answers with others, but make sure that your reflection is in your own words and reflects the conclusions which you arrived at. If you do discuss this assignment with other students from the honors class, please list them at the top of your reflection.

Reflection Questions:

1. What words were new for you in these readings? Pick three of them and look up their definitions. List them below.
2. After reading the Carbon nanotubes article and the blackest black material article, what did you find most surprising/intriguing about how this material was discovered?
3. Look at the pictures of the blackest black and review the researcher's hypothesis on how it is so black. How might absorption and scattering of light explain why this material is the color it is?
4. Compare the features that scientists believe make the black material so black and the white material so white. How are they similar? How are they different?
5. How does the photoelectric effect connect to the solar panels that are helping to power our world and combat climate change? How does understanding how much sunlight is accessible at your house help you understand if solar panels will be able to supply enough power for your house?
6. How does the Parker Space probe exploit the nature of space to help keep it cool? (Hint: Think about the difference between temperature and heat/thermal energy)
7. Applying what you know about reflection, absorption, and scattering explain why the construction of the Parker Space probe shield is so effective.