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The Misunderstood Greenhouse Effect LUCA ZATTI, Univ Degli Studi Di Pavia, CHIARA AIM, Univ Degli Studi Di Pavia, INFN-Pavia, DANIELE AURELIO, Univ Degli Studi Di Pavia, ETTORE BUDASSI, Univ Degli Studi Di Pavia, INFN-Pavia, DIEGO MARAGNANO, Univ Degli Studi Di Pavia, PAOLO MONTAGNA, MICHELE PIROLA, Univ Degli Studi Di Pavia, INFN-Pavia, SIMONE RESTELLI, Univ Degli Studi Di Pavia, DAVIDE SANTOSTASI, "Benedetto Cairoli" High School of Vigevano, Univ Degli Studi Di Pavia, SIMONE VENTURINI, Univ Degli Studi Di Pavia — We propose a thrilling way to show and teach the greenhouse effect theoretically and experimentally to an audience of high-school teachers and students. The goal is to reveal its paramount importance for life on our planet with the right scientific approach. We use simple instruments, like a thermometer, a plastic box, and a light bulb, to simulate the heating process of the surface of the Earth by the Sun. The clear box cover, representing the atmosphere, can be removed, allowing for the experiment with and without the greenhouse effect. Concurrently with the experiment, an effective estimate of the Earth surface temperature can be done. With only a few tools, such as basic math and the Stephan-Boltzmann law, surprising results can be obtained. Without the greenhouse effect life on our planet would be very difficult, with a mean temperature of $-19°$C. Assuming the Earth and the atmosphere as black bodies, the mean temperature reaches 30°C, but a more realistic value can be found just by considering them as grey bodies.This simple experiment introduces the problem of global warming and sensitizes the audience to the fragile equilibrium between man and Nature.

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