What is IAQ?

In spaces for human occupancy indoor air quality (IAQ) is often defined as the extent to which human requirements are met. But what requirements do people have in relation to indoor air? The desire is that the air be perceived as fresh and pleasant, that it has no negative impact on their health, and that the air is stimulating and promotes their work, i.e. it increases their productivity and the learning of their children in the classroom at school. Present ventilation standards and guidelines do not care about productivity and learning and have the very modest requirement that the indoor air shall be 'acceptable,' meaning that the most sensitive group of persons (usually 20%) perceive the air as unacceptable while the remaining less sensitive persons may find the air barely acceptable. With such a modest aim it is not surprising that comprehensive field studies in many countries in buildings in which ventilation standards are met show high percentages of dissatisfied persons and of those suffering from sick building syndrome symptoms. Recent studies show that improvement of IAQ by a factor of 2-7 compared with existing standards increases office productivity and school learning significantly, while decreasing the risk of allergic symptoms and asthma in homes. To make indoor air acceptable, even for the most sensitive persons, an improvement of 1-2 orders of magnitude may be required. The paper will discuss the development of new methods that can provide such substantial improvements of IAQ while maintaining or even decreasing ventilation and energy usage. A paradigm shift is required and further future shifts are foreseen where we learn how to make indoor air equally fresh and pleasant as outdoors when it is best. Or even better, i.e. 'out of this world.'