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Plato's ΤΙΜΑΙΟΣ (TIMAEUS) and Modern Particle Physics
RUPRECHT MACHLEIDT, University of Idaho — It is generally known that the question, “What are the smallest particles (elementary particles) that all matter is made from?”, was posed already in the antiquity. The Greek natural philosophers Leucippus and Democritus were the first to suggest that all matter was made from atoms. Therefore, most people perceive them as the ancient fathers of elementary particle physics. It will be the purpose of my contribution to point out that this perception is wrong. Modern particle physics is not just a primitive atomism. More important than the materialistic particles are the underlying symmetries (e. g., $SU(3)$ and $SU(6)$). A similar idea was first advanced by Plato in his dialog ΤΙΜΑΙΟΣ (Latin translation: TIMAEUS): Geometric symmetries generate the materialistic particles from a few even more elementary items. Plato's vision is amazingly close to the ideas of modern particle physics. This fact, which is unfortunately little known, has been pointed out repeatedly by Heisenberg (see, e. g., Werner Heisenberg, *Across the Frontiers*, Harper & Row, New York, 1974).

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