Alessandro Bile graduated in Theoretical Physics (2017–2018) from Sapienza University of Rome, where he was involved in the VIRGO experiment for the detection of gravitational waves. Alongside his scientific studies, he cultivated a profound passion for music, graduating in the same year from the "Santa Cecilia" Conservatory in Rome with a thesis interweaving gravitational-wave physics and musical composition. As a composer, he has performed in concerts held in Rome and New York.

In 2019, he furthered his training with an advanced postgraduate course in Machine Learning in Bergamo. In 2022, he completed his Ph.D. in Electromagnetism at Sapienza University of Rome, earning the title of Doctor Europaeus, with a research focus on photonic artificial intelligence. This line of inquiry continues to inform his current work in mathematical modelling and the design of intelligent hardware systems operating in the optical domain, with particular emphasis on photorefractive solitons and neuromorphic architectures for optical computing.

A research fellow at the Department of Basic and Applied Sciences for Engineering, Sapienza University of Rome, since 2019, he was awarded funding for early-career researchers for three consecutive years (2020–2022) and, in 2022, received the BGF fellowship from the French government to conduct research as a Visiting Researcher at the Femto-ST Institute, Université de Franche-Comté, Besançon. His research, presented at international conferences throughout Europe, spans metamaterials for mid-infrared emission manipulation, artificial intelligence applied to the conservation of cultural heritage, predictive modelling of microclimatic fluctuations, and AI-based educational tutoring systems, developed in collaboration with institutions and partners including Lauro, Zanichelli and Sapienza. He is a lecturer at international conferences and schools on topics related to artificial intelligence, and teaches AI in collaboration with several institutions, including Europass Teacher Academy and Fondazione Mondo Digitale ETS.

Since 2022, he has served as adjunct professor of Physics at the Faculty of Medicine, Sapienza University of Rome, following several years of teaching Physics at the Faculty of Civil and Industrial Engineering of the same university.

He is the author, with Springer Nature, of two monographs devoted to solitonic neural networks — Solitonic Neural Networks: An Innovative Photonic Neural Network Based on Solitonic Interconnections and its Italian edition, Reti Neurali Solitoniche: Un Innovativo Network Neurale Fotonico Basato su Interconnessioni Solitoniche. With his latest book, When Light Becomes Mind: From Brain Circuits to Photonic Intelligence, Alessandro Bile extends his scholarly inquiry into a work of scientific narrative, guiding readers on a journey from the biological brain to an unexpected frontier of physics, in which networks of light learn by reshaping the very material they inhabit.