Many scientific disciplines are interested in classifying and quantifying items in the world around us. Examples are numerous, such as assigning a species to a given biological genus or quantifying a person’s cholesterol levels. Within the field of forensic science, it is not only important to classify and quantify, but also to attempt to individualize an item to a particular source, at the probable exclusion of all other sources. A classic example of this is forensic DNA testing which is often reported as a likelihood ratio as a function of population frequency studies and the multiplication rule for independent events. Unfortunately, it is much more difficult to prove probable exclusion in most other forensic disciplines. This is particularly true with forensic pattern evidence, which is a form of impression evidence created when two objects come into contact (e.g., fingerprints, footwear, cartridge cases, etc.). First, we presume that the characteristics that allow exclusion are randomly acquired, and if this is true, then these features are likely to occur so infrequently to make population studies unrealistic. Second, how best should we quantify minute details that are considered sufficient to differentiate items? Classically, this has been accomplished by a trained and experienced human observer (acknowledging that the conclusions are complicated by some inherent level of bias and subjectivity). In response to these (and a myriad of other) concerns, the National Academy of Sciences (2009) reviewed and published a proposed path forward for forensic science in the United States. In response, the forensic research community has witnessed increasing interest and support for objective and numerically driven post-classical solutions to many fundamental questions in forensic science. This talk will summarize past and expected future trends, as well as the role that imaging science can play in advancing the field.