ChatGPT Shows up at the 2025 Balzan Prizewinners Interdisciplinary Forum

Francesco Ranci
Sociologist, writer and freelance journalist

Serendipity (or Lady Luck), is Alive and Well

A long time ago, historians of science started to come up with examples of how "progress" – sometimes – needs a push from Lady Luck. Ernst Mach wrote and talked about it at the very beginning of the last century, for example, following in the footsteps of Charles Darwin's pathbreaking theory of natural selection. Call it "serendipity", or "chance", or just "luck", it can happen in a scientist's career, just as it does in anybody else's everyday life. For example, a person may have to endure a delay in closing their day of work at a grocery store, have to cover for a colleague who is late, and be home late themselves as a result of it – but just to find out that, surprisingly, their loved ones are not at all angry, or (God forbid) have left the scene altogether. Instead, they are only more aware of how much they love each other, including how much they are loved by the latecomer of the day. In other words, an unfortunate turn of events may sometimes turn out to be a blessing.

Carl H. June, the 2025 Balzan Prize Winner for Gene and Gene-Modified Cell Therapy, had a similar story to tell at the 2025 Balzan Prizewinner Interdisciplinary Forum held at the historic Rathaus in Bern on 13 November 2025. One may be caught in a delay in public transportation, as June was, arriving late at his laboratory and – more importantly – missing a crucial deadline. However, a missed deadline may turn out to be unexpectedly helpful. Someone else may also have been slower at getting there than they were supposed to be – and so may have done some extra work during that time. June's "failure" to be in the lab on time to catch a number of mice's immune systems in a given stage of their development – in their fight against a given pathogen – allowed him to discover that they needed nothing more than to be left alone for three more hours. The cure was already within them.

June went on from there to develop a revolutionary set of therapies based on the principle of the "living drug", i.e., using the patient's own immune system cells, or T cells, which are genetically engineered in order to be specific for an antigen expressed on given tumor cells. In other words, considering the patient's "self-defensive weaponry", the ability to recognize a new "target" is added to the body's already existing and functioning equipment. Had there not been that massive failure of Geneva's public transportation system a few decades ago, no one really knows (except possibly June himself) what would have happened to this paradigm shift in oncology – and at the same time, the successful application of gene-based therapy. At the very least, however, it would have had to wait for a better day.

But there was more to say about his unfortunate but lucky turn of events in June's life on the occasion of the 2025 Balzan Prizewinners Interdisciplinary Forum. Moderator Marta Cartabia, President of the Balzan General Prize Committee, pointed out that the rapidly increasing implementation of algorithms in scientific research, as well as in our social life as a whole, may significantly decrease the number of "serendipity opportunities" in our lives such as that important one he had had as a young researcher – and June fully agreed with her on this point. He
observed that, on the other hand, the use of algorithms in scientific research allows for a much more effective manipulation of existing data including, as also noted by General Prize Committee Member Alberto Mantovani, the "automatic" configuration of testable hypotheses. It goes without saying that such regularities coming from the application of algorithms to large databases could also be incorrectly taken for already verified "data". To Cartabia's observation, June replied that the question of balancing out opportunities and risks in this field of knowledge is «the most important question of our times».

Will ChatGPT Kill "Lady Luck"?

Further discussions on serendipity and AI ensued at the Prizewinners Forum. Christophe Salomon is the 2025 Balzan Prize Winner for Atoms and Ultra-Precise Measurement of Time. His work uses ultracold atoms to "measure time", meaning by "measure" to build a device to be used as a dynamic term of reference for other natural or artificial processes, since – as Salomon pointed out – Newton's concept of "time" did not

survive Einstein's critique. Thus, time is measured with extreme precision, which has brought to us the development of atomic clocks on which GPS services are based. Salomon will use his Balzan research funds to further support the European ACES/PHARAO space clock initiative devoted to the synchronization of all terrestrial clocks with a single satellite-based "time measurement" apparatus.
In reflecting on his life's work at the Balzan Forum, Salomon could cite another example of a "paradigm shift" (or an "anomaly", in Thomas Kuhn's model) involving the actual temperature of Celsius atoms when cooled with laser beams, which he found to be quite different from his expectations based on Einstein's relativity theory.
His work highlights how unexpected results within controlled experiments can challenge an established theory.

A similar role of anomaly (or intervention of serendipity) can be seen in Carl June's scientific career. As mentioned in his talk, he had learned from biology textbooks that steroids did not increase an athlete's strength, but only "swelled" muscle tissues. However, June quickly recognized this mistaken assumption as such at a time when athletes were being caught unlawfully using steroids in order to win various kinds of sports competitions. He had gained direct knowledge of the actual effect of steroids while serving in the U.S. military during the war in Vietnam. Contrary to Salomon, June did not need to engage in complicated laboratory work to find out that there was a "hole" in accepted theory.

During the Forum, Salomon also took a great interest in the aforementioned discussion about the use of algorithms in scientific research, pointing out the difficulty that such "artificial intelligence" devices must encounter in dealing with theoretical deficiencies they may be provided with, beginning with the still underdeveloped (according to Salomon) theoretical bases of their functioning. He asked June if in his field of knowledge – where computer simulations can model every detail of cells and organisms – as in his own it is possible to artificially generate models of dynamical processes, as opposed to static configurations of elements. Although framed as a question, Salomon pointed that only static models can be artificially generated in his domain, namely physics and chemistry. June clearly agreed that such a limitation had to be acknowledged in his field, too. However, at that point in the discussion, an unidentified audience member objected

to both speakers, having put Salomon's same question to ChatGPT and received the unequivocal answer that it would be false to argue that ChatGPT is unable to model dynamical processes – for example, it can easily do so in the field of weather forecasting.

Obviously – as the IBM computer Deep Blue famously defeated reigning World Chess Champion Garry Kasparov for the first time almost thirty years ago – Salomon's question should be framed in the context of his and June's respective disciplines. Considered more broadly, the problem Salomon raised is to be understood with reference to the traditional problem of "induction" in philosophy and classical cybernetics (see, for example, Vittorio Somenzi, "Can induction be mechanized?", *Methodos*, vol. 7, nn. 25-26, 1955). Avoiding "theory of knowledge" issues – like what we mean by "induction" – even a videogame can be used as an example of an "artificially generated" model for a given, already known kind of process. Such a model may then function as a paradigm for processes subsequently observed as happening, or put in place (according to the model's instructions) in the "real world", here understood as everything which is not the symbolic representation offered by the "artificial intelligence" model (which is actually part of the "real world" too).

Luckily in any case, the Balzan General Prize Committee has identified precisely this field of knowledge – how we understand and use these algorithms – as being worthy of the 2026 Balzan Prize for The Social Science of Digital Technology.