A FORMAL TECHNICAL TEXT

Near Earth Objects (NEOs) include comets and asteroids as well as the so-called ‘killer’ objects that could potentially collide with the Earth. Fortunately, these objects with sizes of over 1 km are extremely rare, yet our planet is continually being struck by much smaller objects the size of sand grains that burn up in the atmosphere in meteor showers and that bring us about 100 tonnes of matter every day. A potentially hazardous NEO is one larger than 140 m that intercepts the Earth’s orbit. An observatory dedicated to searching for these objects is the 2008 Panoramic Survey Telescope and Rapid Response System (Pan-STARRS), which operates a pair of wide-field 1.8 m Ritchey-Chrétien survey telescopes in Hawaii. Pan-STARRS has detected many new solar system objects as well as variable stars and supernovae. In 2017 it discovered Oumuamua, an object between 100 m and 1 km across and the first interstellar object ever seen passing through the solar system on an unbound hyperbolic trajectory. It has been speculated that Oumuamua may have been ejected from an exoplanetary system. On 26 September 2022, NASA deliberately crashed a spacecraft, the Double Asteroid Redirection Test (DART), into a 163 m-wide asteroid moonlet (Dimorphos) which is orbiting a larger asteroid, Didymos. This was an experiment to find out if the impulse from the collision could deflect the moonlet into a different orbit, and it was the first ever test of a planetary defence system that could potentially save us from the fate that befell the non-avian dinosaurs 66 million years ago, when three-quarters of Earth’s species became extinct. The extinction event is generally believed to have resulted from the impact of a 10 km-wide asteroid in the Gulf of Mexico, known as the Chicxulub impactor. Observations were made using ground- and space-based observatories, including both the Hubble and Webb telescopes. These showed an initial cloud of material ejected from DART’s impact on Dimorphos and confirmed that the collision has changed the moonlet asteroid’s motion in space, reducing its orbital period by around 5 per cent. The night sky, far from being quiescent, is punctuated by the movement or change in brightness of objects, sometimes across all wavebands. However, not all of these time-varying objects emit electromagnetic radiation, and in the next chapter the theme will continue as we look at two new cosmic messengers.

(an excerpt from Geoff Cottrell’s *Observational astronomy*)

AN INFORMAL TECHNICAL TEXT

The junk mail, now rightly convinced that it was talking to a human being, began the spiel it had refused to waste on her digital proxy. "Maria, I know your time is valuable, but I hope you can spare a few seconds to hear me out." It paused for a moment, to make her feel that her silence was some kind of assent. "I also know that you're a highly intelligent, discerning woman, with no interest whatsoever in the muddled, irrational superstitions of the past, the fairy tales that comforted humanity in its infancy." Maria guessed what was coming next; the interactive saw it

on her face—she hadn't bothered to hide behind any kind of filter—and it rushed to get a hook in. "No truly intelligent person, though, ever dismisses an idea without taking the trouble to evaluate it—skceptically, but fairly—and here at the Church of the God Who Makes No Difference—"

Maria pointed two fingers at the interactive, and it died. She wondered if it was her mother who'd set the Church onto her, but that was unlikely. They must have targeted their new member's family automatically; if consulted, Francesca would have told them that they'd be wasting their time. Maria invoked Camel's Eye and told it, "Update my mask so it reacts as I did in that exchange." A brief silence followed. Maria imagined the synaptic weighting parameters being juggled in the mask's neural net, as the training algorithm hunted for values which would guarantee the required response. She thought: If I keep on doing this, the mask is going to end up as much like me as a fully fledged Copy. And what's the point of saving yourself from the tedium of talking to junk mail if... you're not? It was a deeply unpleasant notion . .. but masks were orders of magnitude less sophisticated than Copies; they had about as many neurons as the average goldfish—organized in a far less human fashion. Worrying about their "experience" would be as ludicrous as feeling guilty about terminating junk mail.

Camel's Eye said, "Done."

It was only 8:15. The whole day loomed ahead, promising nothing but bills. With no contract work coming in for the past two months, Maria had written half a dozen pieces of consumer software—mostly home-security upgrades, supposedly in high demand. So far, she'd sold none of them; a few thousand people had read the catalogue entries, but nobody had been persuaded to download. The prospect of embarking on another such project wasn't exactly electrifying—but she had no real alternative. And once the recession was over and people started buying again, it would have been time well spent.

First, though, she needed to cheer herself up. If she worked in the Autoverse, just for half an hour or so—until nine o'clock at the latest—then she'd be able to face the rest of the day...

Then again, she could always try to face the rest of the day without bribing herself, just once. The Autoverse was a waste of money, and a waste of time—a hobby she could justify when things were going well, but an indulgence she could ill afford right now. Maria put an end to her indecision in the usual way. She logged on to her Joint Supercomputer Network account—pay-lag a fifty-dollar fee for the privilege, which she now had to make worthwhile. She slipped on her force gloves and prodded an icon, a wireframe of a cube, on the terminal's flatscreen— and the three-dimensional workspace in front of the screen came to life, borders outlined by a faint holographic grid.

(an excerpt from Greg Egan’s book *Permutatuon city)*