1145-37-1160   **Anca Radulescu*** (`radulesa@newpaltz.edu`), 1 Hawk Dr., Department of Mathematics, New Paltz, NY 12561, and **Kelsey Butera** and **Brandee Williams**. *Template iterations of quadratic maps and hybrid Mandelbrot sets.*

As a particular problem within the field of non-autonomous discrete systems, we consider iterations of two quadratic maps $f_{c_0} = z^2 + c_0$ and $f_{c_1} = z^2 + c_1$, according to a prescribed binary sequence (template). We study the parameter locus for which critical orbits are bounded (the "Mandelbrot set"). For a fixed template, one may consider this locus as a subset of $(c_0, c_1) \in \mathbb{C}^2$; for fixed quadratic parameters, one may consider the subset of templates which produce a bounded critical orbit. We consider both situations, as well as "hybrids", and study topological properties of these sets.

We discuss the potential of using this mathematical framework (in which one can apply a "good" transformation f_{c_1} versus an "erroneous" f_{c_0}) to study the effect of errors in copying mechanisms (such as DNA replication). We consider problems that a sustainable replication system may have to solve when facing the potential for errors. We find that it is possible to tell which specific errors are more likely to affect the system's dynamics. We find that it is possible to tell which specific errors are more likely to affect the system's dynamics, in absence of prior knowledge of their timing. (Received September 19, 2018)