1072-46-221 **Fabio Cipriani** and **Daniele Guido*** (guido@mat.uniroma2.it), Dipartimento di Matematica, Univ. Roma Tor Vergata, via della Ricerca Scientifica, Roma, Italy, and **Tommaso Isola** and **Jean-Luc Sauvageot**. *Differential 1-forms, their Integrals and Potential Theory on the Sierpinski Gasket.*

We provide a definition of differential 1-forms on the Sierpinski gasket K and their integrals on paths. We show how these tools can be used to build up a Potential Theory on K. In particular, we prove: i) a de Rham re-construction of a 1-form from its periods around lacunas in K; ii) a Hodge decomposition of 1-forms with respect to the Hilbertian energy norm; iii) the existence of potentials of elementary 1-forms on suitable covering spaces of K. We then apply this framework to the topology of the fractal K, showing that each element of the dual of the first Cech homology group is represented by a suitable harmonic 1-form [arXiv:1105.1995] (Received June 28, 2011)