

Abstract Submitted
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Thermotronics for thermal light¹ PHILIPPE BEN-ABDALLAH, Laboratoire Charles Fabry, CNRS, Institut d'Optique, SVEND-AGE BIEHS, Institut für Physik, Carl von Ossietzky Universität, THERMOPLASMONIC COLLABORATION, PROCOPE COLLABORATION — The control of electric current in solids is at the origin of the modern electronics which have revolutionized our current life. The diode, the transistor and the volatile memory introduced respectively by Braun in 1846, Williams and Kilburn in 1946 and by Bardeen and Brattain in 1948 are undoubtedly the corner stones of almost all modern systems of information treatment. Such elementary devices allow for rectifying, switching, modulating and even amplifying the electric current and allow for storing bits of information. Similar devices which make possible the control of heat flow are not as widespread in our daily life. In 2000s Baowen Li et al. have proposed thermal counterparts of transistors and memories using phononic circuits made with interconnected solid segments. However, this technology suffers from some weakness (slow operating speed, presence of Kapitza resistance which strongly reduced the magnitude heat flux) of fundamental nature which intrinsically limit its performances. In this work we discuss the possibility of a contactless technology for the thermal management of systems from nano to macroscale by introducing the concepts of radiative thermal diodes, radiative transistor and radiative thermal memory.

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