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CLAIMS

I claim :

1. A nanoelectronic apparatus comprising : a single-electron tunnelling (SET) network with multiple input electrodes and a single output electrodes, a binary counter applying voltages on a subset of the said inputs, a bit array applying voltages to the remaining subset of the said inputs, a current-mode comparator connected to the said output.
2. A nanoelectronic apparatus as in Claim 1, wherein the said SET network is fabricated by a nanomaterial thin film, to be utilized as a strong physical unclonable function (PUF).
3. A method for data encryption using several strong PUFs in parallel and permuting their responses to generate a one-time pad key.
4. A nanoelectronic apparatus as in Claim 1, wherein the said SET network is simulated, to be utilized as a backdoor-free pseudorandom number generator.

Celustine Preetnam
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Chennai.

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