CLAIMS:

1. A MEMS vapor bubble generator comprising:

a chamber for holding liquid; and

a resistive heater positioned in the chamber for thermal contact with the liquid;

wherein,

the resistive heater is formed from a superalloy, the superalloy being ~~and~~ configured to receive~~d~~ an actuation signal from associated drive circuitry such that upon actuation the heater heats some of the liquid to a temperature above its bubble nucleation point in order to generate a vapor bubble that causes a pressure pulse through the liquid; and

the superalloy is MCrAlX, where M is one or more of Ni,Co,Fe with M contributing at least 50% by weight, Cr contributing 2% and 35% by weight, Al contributing more than zero but less than 8% by weight, and X contributing less than 25% by weight, with X consisting of zero or more other elements, preferably including but not limited to Mo, Re, Ru, Ti, Ta, V, W, Nb, Zr, B, C, Si, Y, Hf.

2. A MEMS vapor bubble generator according to claim 1 wherein the chamber has a nozzle opening such that the pressure pulse ejects a drop of the liquid through the nozzle opening.

3. A MEMS vapor bubble generator according to claim 2 wherein the chamber has an inlet for fluid communication with a supply of the liquid such that liquid from the supply flows into the chamber to replace the drop of liquid ejected through the nozzle opening.

4. A MEMS vapor bubble generator according to claim 1 wherein the heater is deposited by a sputtering process such that the superalloy has a nanocrystalline microstructure.

5. A MEMS vapor bubble generator according to claim 1 wherein the heater element is deposited as a layer of the superalloy less than 2 microns thick.

~~6. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has a Cr content between 2.0% by weight and 35.0% by weight.~~

~~7~~6. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has a Al content of between 0.1% by weight and 8.0% by weight.

~~8~~7. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has a Mo content of between 1.0% by weight and 17.0% by weight

~~9~~8. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has a Nb and/or Ta content totalling between 0.25% by weight and 8.0% by weight.

~~10~~9. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has a Ti content of between 0.1% by weight and 5.0% by weight.

~~11~~10. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has up to 5% by weight of reactive metal from the group consisting of yttrium, lanthanum and other rare earth elements

~~12~~11. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has a Fe content of up to 60% by weight.

~~13~~12. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has a Ni content of between 25% by weight and 70% by weight.

~~14~~13. A MEMS vapor bubble generator according to claim 1 wherein the superalloy has a Co content of between 35% by weight and 65% by weight.

~~15. A MEMS vapor bubble generator according to claim 1 wherein the superalloy is MCrAlX, where M is one or more of Ni,Co,Fe with M contributing at least 50% by weight, Cr contributing 8% and 35% by weight, Al contributing more than zero but less than 8% by weight, and X contributing less than 25% by weight, with X consisting of zero or more other elements, preferably including but not limited to Mo, Re, Ru, Ti, Ta, V, W, Nb, Zr, B, C, Si, Y, Hf.~~

~~16~~14. A MEMS vapor bubble generator according to claim 1 wherein the superalloy comprises Ni, Fe, Cr and Al together with additives consisting of zero or more other elements, preferably including but not limited to

Mo, Re, Ru, Ti, Ta, V, W, Nb, Zr, B, C, Si, Y, or Hf.

~~17~~15. A MEMS vapor bubble generator according to claim 1 wherein the superalloy is selected from:

INCONEL™ Alloy 600, Alloy 601, Alloy 617, Alloy 625, Alloy 625LCF, Alloy 690, Alloy 693, Alloy 718, Alloy X-750, Alloy 783, Alloy 725, Alloy 751, Alloy MA754, Alloy MA758, Alloy 925, or Alloy HX;

INCOLOY™ Alloy 330, Alloy 800, Alloy 800H, Alloy 800HT, Alloy MA956, Alloy A-286, or Alloy DS;

NIMONIC™ Alloy 75, Alloy 80A5 or Alloy 90;

BRIGHTRAY® Alloy B, Alloy C, Alloy F, Alloy S, or Alloy 35; or,

FERRY® Alloy or Thermo-Span® Alloy.