

( )



$S = k \log W$

Planck

(Boltzmann)

1

20

(Gibbs)

---

1

2007

1982

(Wilson)

2

(Navier-Stokes)

1993

<sup>3</sup> 1997

Jarzynski

<sup>4</sup>

(Onsager)

<sup>5</sup>

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<sup>3</sup> D. J. Evans, E.G. D. Cohen and G. P. Morriss, Phys. Rev. Lett. **71**, 2401 (1993).

<sup>4</sup> C. Jarzynski, Phys. Rev. Lett. **78**, 2690 (1997).

<sup>5</sup> T. Harada and S. Sasa, Phys. Rev. Lett. **95**, 130602 (2005).

(Liouville)

1970

6

(Heisenberg)

7

RNA

---

6

7

2008

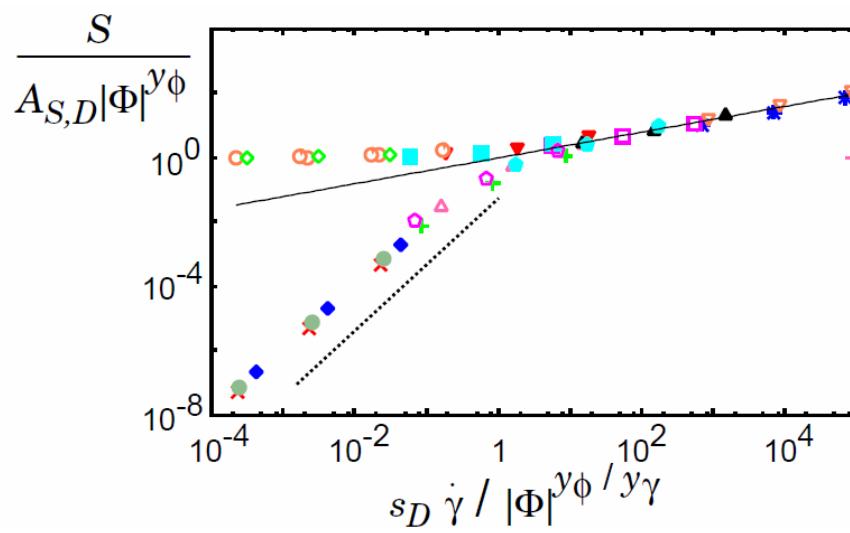
1958

2007

L. Mahadevan

(Liu)

(Nagel)



4 S  
 $y_\phi, y_\gamma$

(M. Otsuki and H. Hayakawa, Prog. Theor. Phys.**121**,  
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Physics Today

(Prigogine)

2001

Evans,

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Sam Edwards

Wilson

Kadanoff