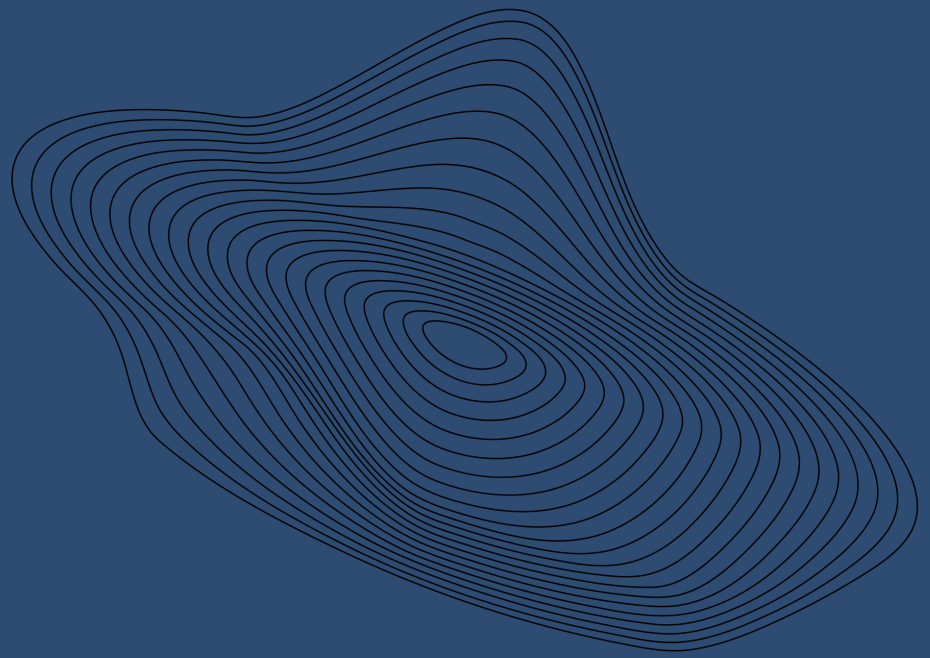

INVISIBLE TRACES OF CONFORMAL SYMMETRY BREAKING

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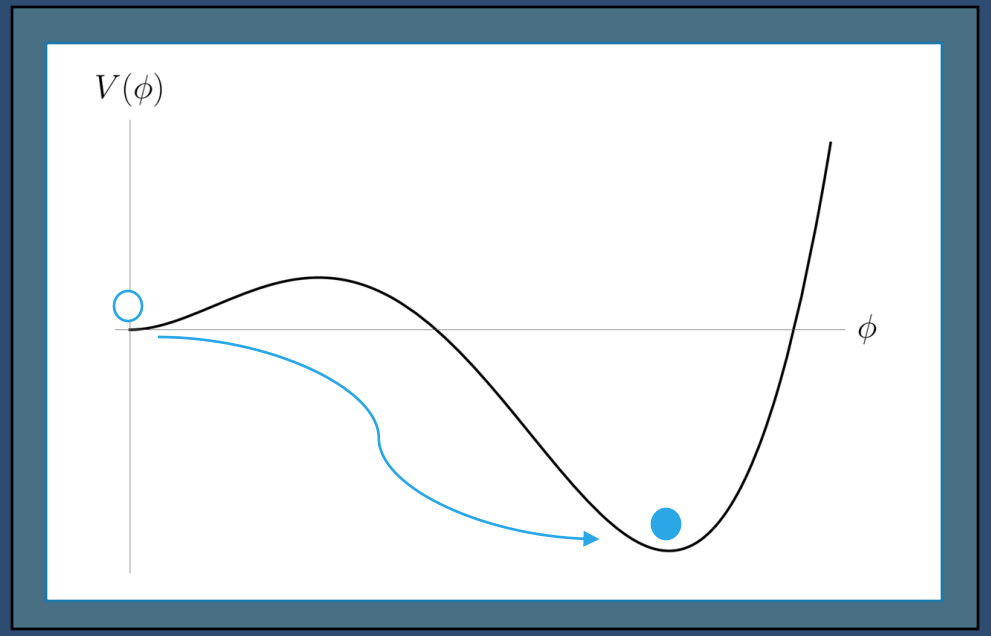
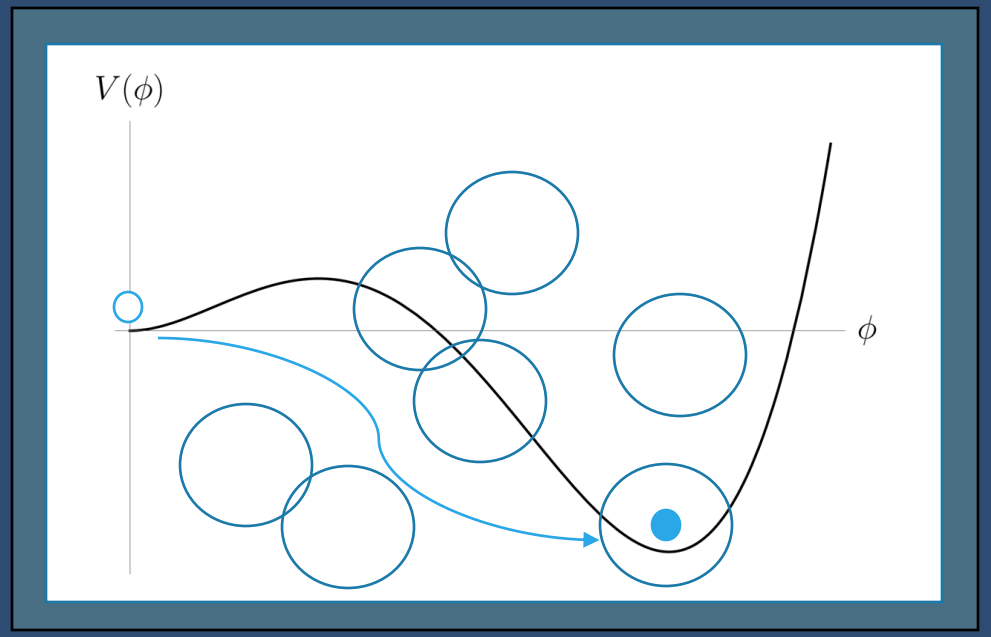
in collaboration with Alexandros Karam, Bogumiła Świeżewska.


Yo, I'm
free


Yo, I'm
free


$V(\phi)$
ϕ


Yo, I'm
free


$V(\phi)$
ϕ

References:
[1] C. D. Carone and R. Ramos, *Classical scale-invariance, the electroweak scale and vector dark matter*, [arXiv:1307.8428].
[2] T. Hambye, A. Strumia, and D. Teresi, *Super-cool Dark Matter*, arXiv:1805.01473.
[3] I. Baldes and C. Garcia-Cely, *Strong gravitational radiation from a simple dark matter model,* arXiv:1809.01198.
[4] T. Prokopec, J. Rezacek, B. Świeżewska, *Gravitational waves from conformal symmetry breaking,* arXiv:1809.11129

Features:

- classical conformal symmetry,
- all masses generated via Coleman-Weinberg mechanism,
- hierarchy problem alleviated,
- perturbative and stable up to the Planck scale,
- exhibits supercooling,
- vector DM candidate, gauge boson X

References:

[1] C. D. Carone and R. Ramos, *Classical scale-invariance, the electroweak scale and vector dark matter*, arXiv:1307.8428.
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- classical conformal symmetry,
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Supercooling:

- phase transition happens at temperatures significantly below EW scale,
- thermally produced barrier last till the $T = 0$,
- induces strong Gravitational Wave signal.

References:

[1] C. D. Carone and R. Ramos, *Classical scale-invariance, the electroweak scale and vector dark matter*, arXiv:1307.8428.
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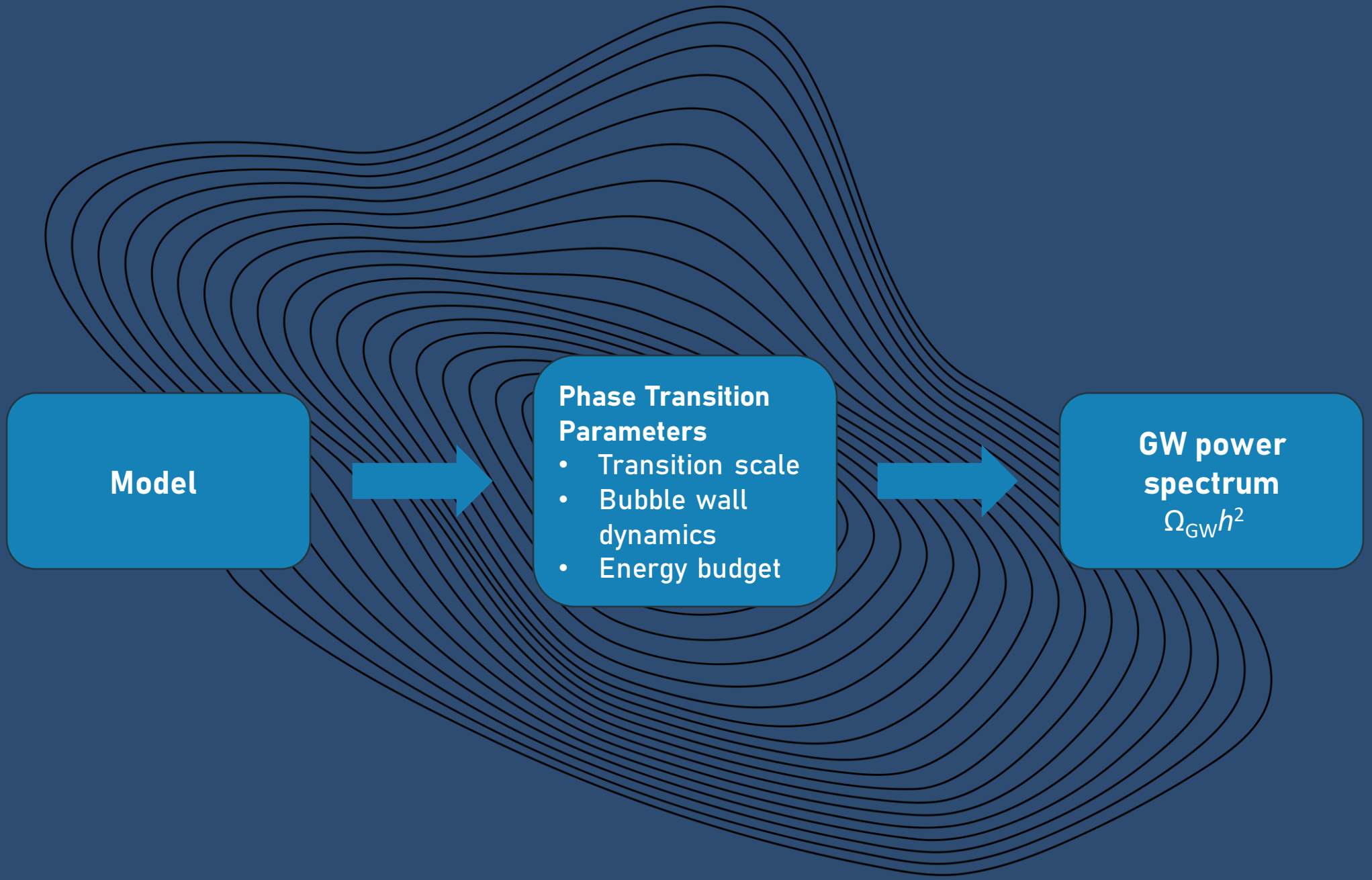
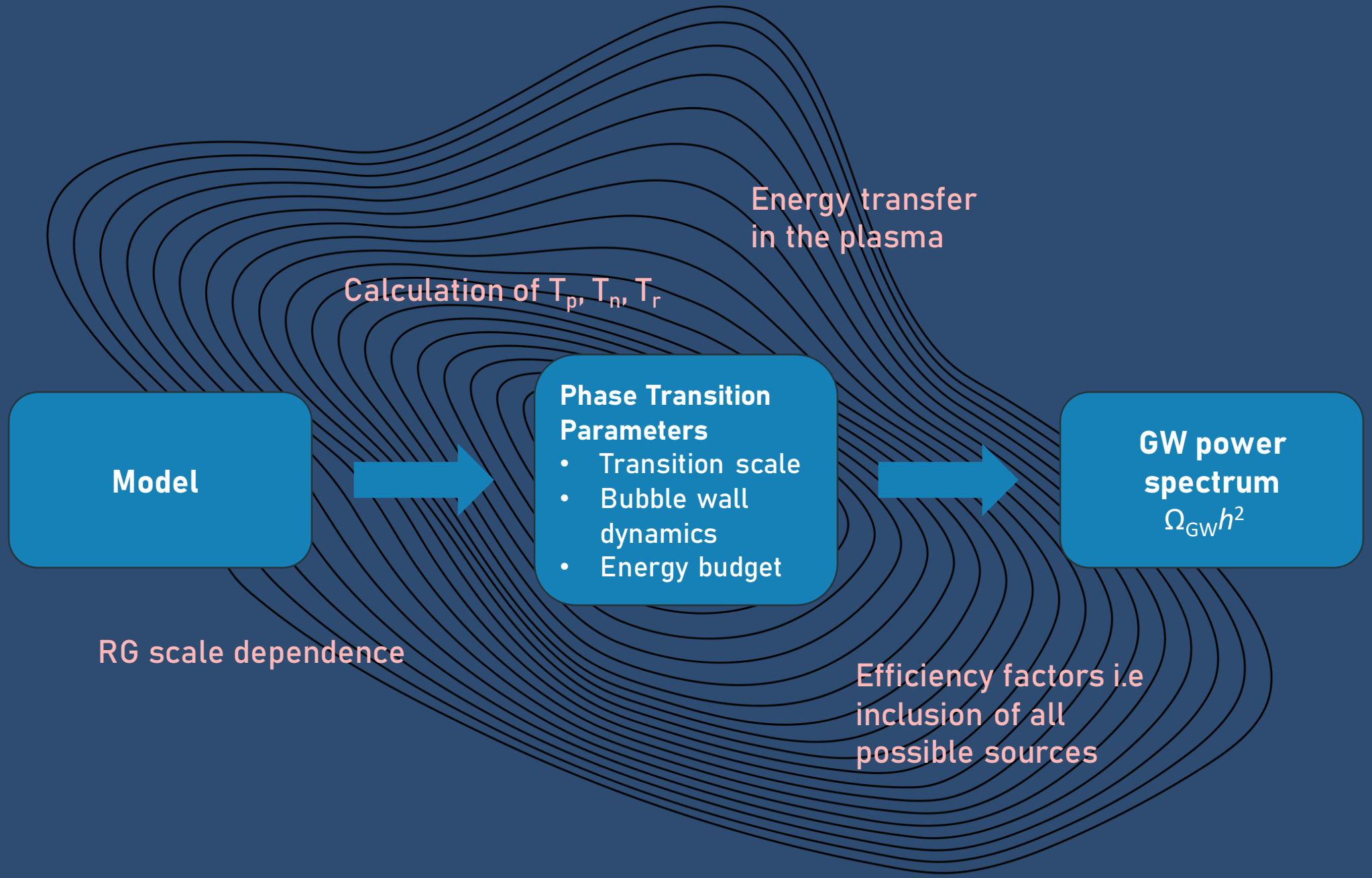
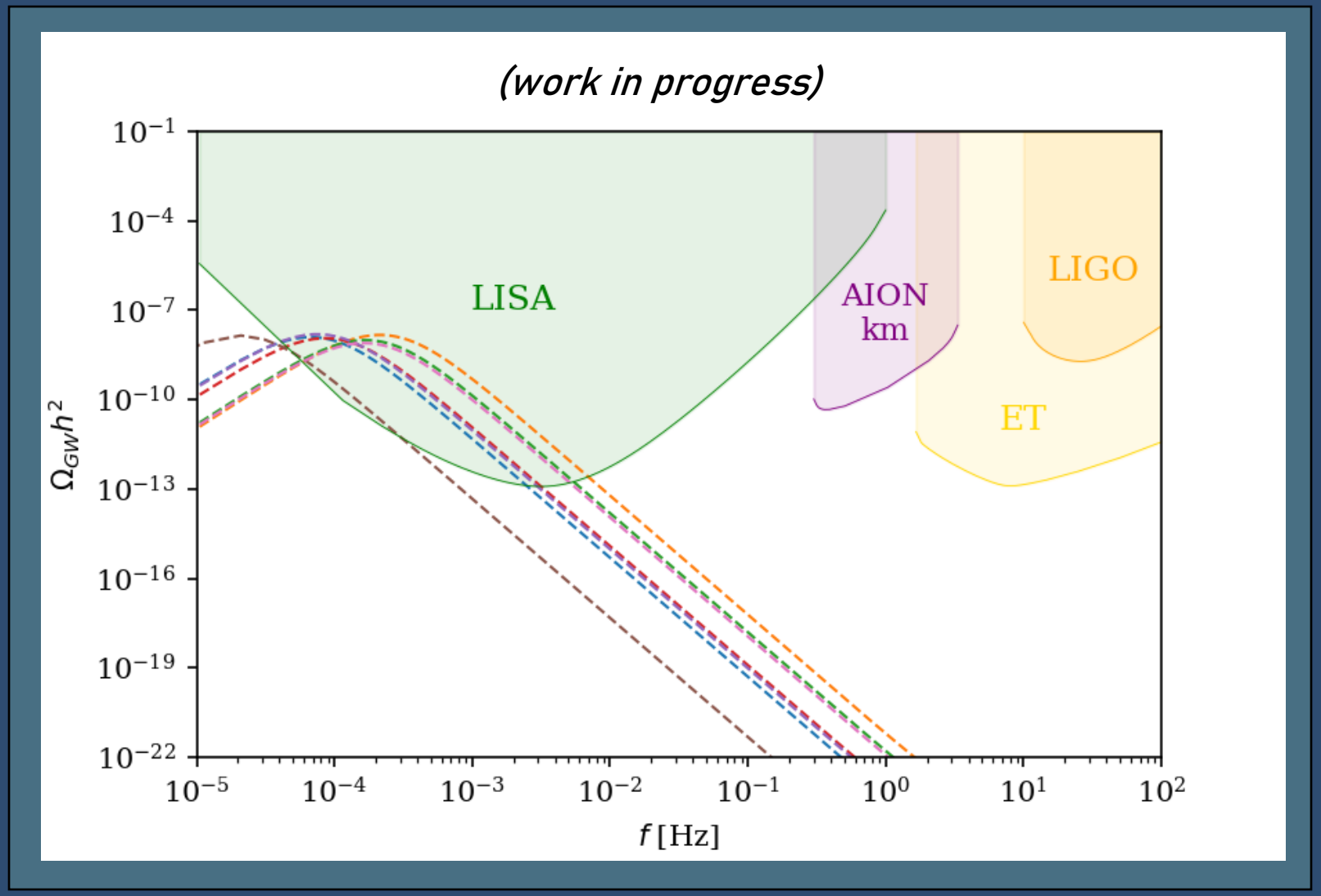

Model
Phase Transition Parameters
• Transition scale
• Bubble wall dynamics
• Energy budget
GW power spectrum
$\Omega_{GW}h^2$



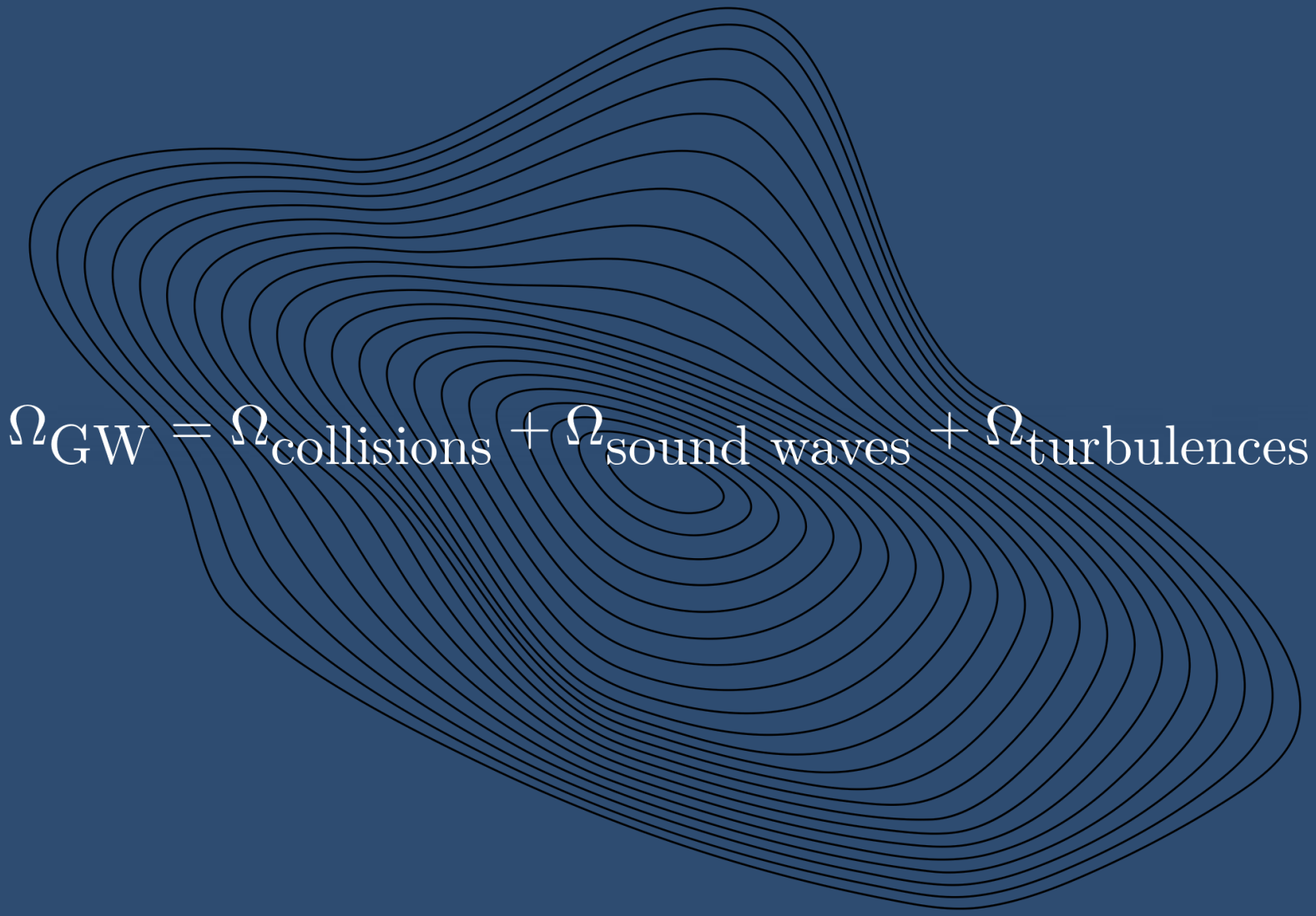
J. Ellis, M. Lewicki, V. Vaskonen, "*Updated predictions for gravitational waves produced in a strongly supercooled phase transition*", arXiv:2007.15586



Goal: provide accurate predictions for LISA.

Thank you

NARODOWE CENTRUM NAUKI


$\Omega_{\mathrm{GW}} = \Omega_{\mathrm{collisions}} + \Omega_{\mathrm{sound\ waves}} + \Omega_{\mathrm{turbulences}}$