Stefano Chessa

PhD
Nanoscience

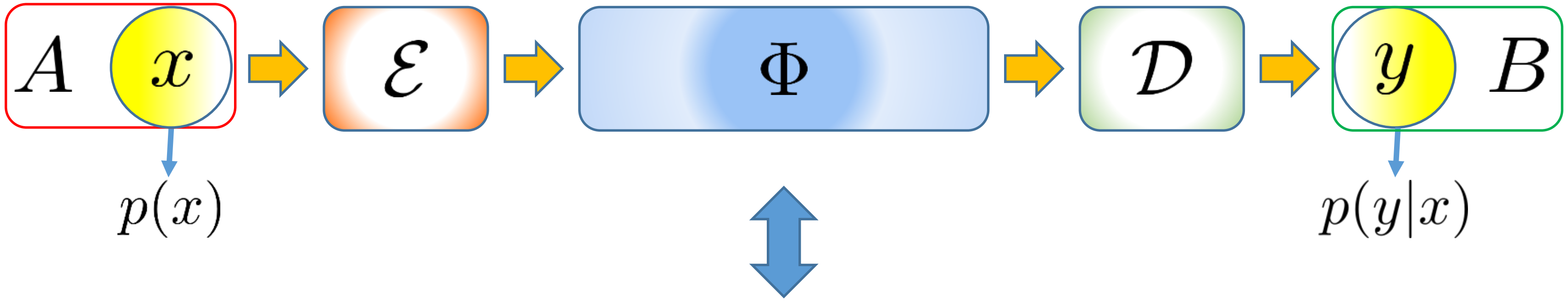
Year II

Research Project

- Research project
- Conferences

Quantum Information & Communication

- **Communication channels:**



Characterization

Research Project

- Research project
- Conferences

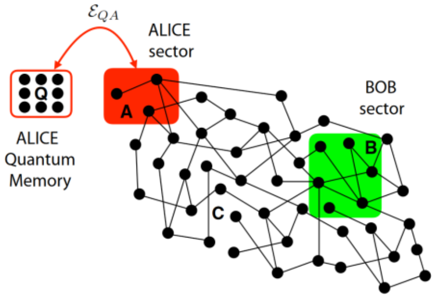
Last year:

- **Quantum channel: spin networks**

PHYSICAL REVIEW A **100**, 032311 (2019)

Quantum-capacity bounds in spin-network communication channels

Stefano Chessa,* Marco Fanizza, and Vittorio Giovannetti
NEST, Scuola Normale Superiore and Istituto Nanoscienze-CNR, I-56126 Pisa, Italy



PHYSICAL REVIEW A **100**, 052309 (2019)

Time-polynomial Lieb-Robinson bounds for finite-range spin-network models

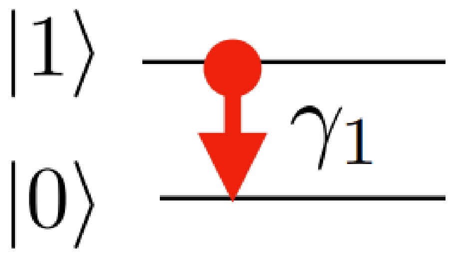
Stefano Chessa* and Vittorio Giovannetti

- Research project
- Conferences

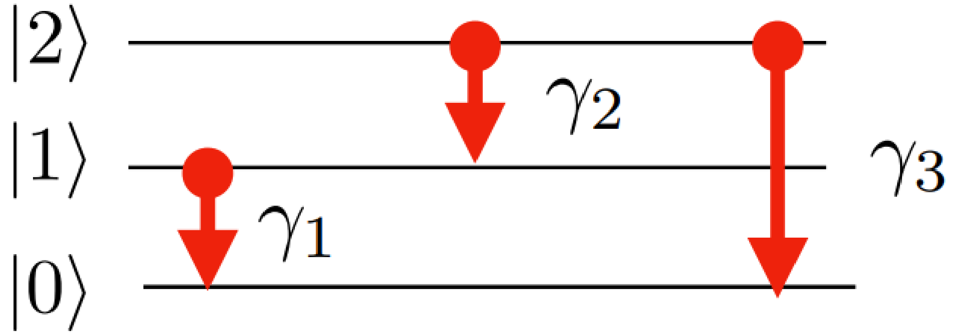
Research Project

This year:

- **Quantum channel: Amplitude damping**



MORE LEVELS



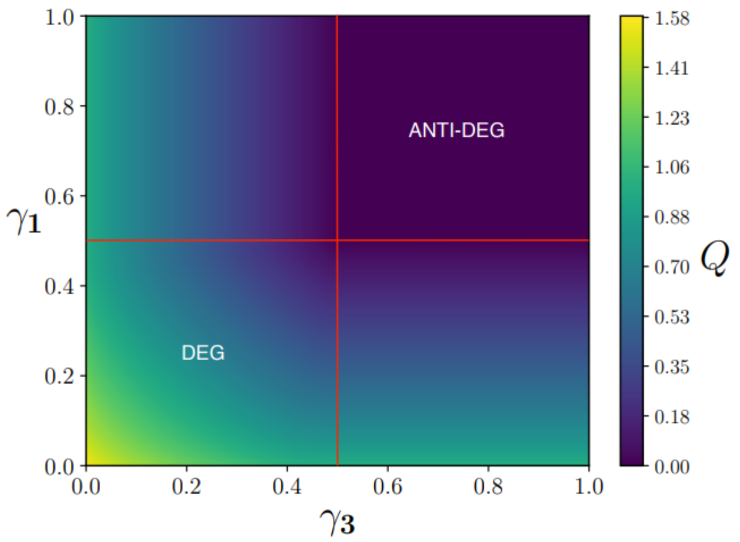
Research Project

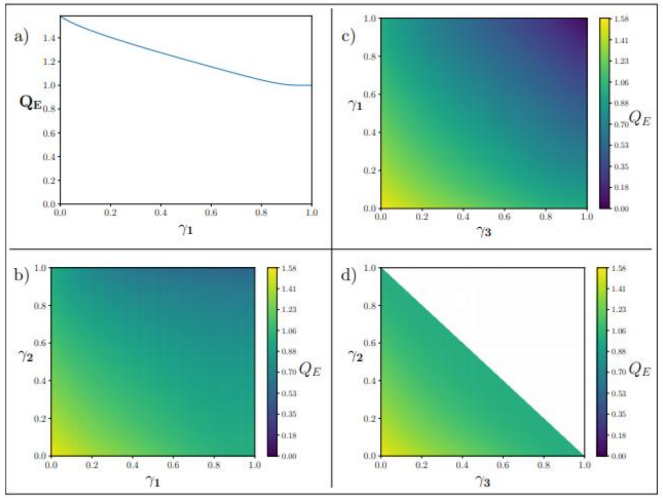
- Research project
- Conferences

This year:

Multi-level Amplitude Damping channels: quantum capacity analysis

Stefano Chessa[1,*] and Vittorio Giovannetti[1]
[1] *NEST, Scuola Normale Superiore and Istituto Nanoscienze-CNR, I-56126 Pisa, Italy*
(Dated: August 5, 2020)





Research Project

- Research project
- Conferences

This year:

- **Quantum channel:**
  Partially Coherent Direct Sum channels

$$\Phi_{\mathrm{CC}}\left[\begin{array}{c|c}\hat{\Theta}_{\mathrm{AA}} & \hat{\Theta}_{\mathrm{AB}} \\ \hline \hat{\Theta}_{\mathrm{BA}} & \hat{\Theta}_{\mathrm{BB}}\end{array}\right]=\left[\begin{array}{c|c}\Phi_{\mathrm{AA}}[\hat{\Theta}_{\mathrm{AA}}] & \Phi^{(\mathrm{off})}_{\mathrm{AB}}[\hat{\Theta}_{\mathrm{AB}}] \\ \hline \Phi^{(\mathrm{off})}_{\mathrm{BA}}[\hat{\Theta}_{\mathrm{BA}}] & \Phi_{\mathrm{BB}}[\hat{\Theta}_{\mathrm{BB}}]\end{array}\right]$$

- Research project
- Conferences

Research Project

This year:

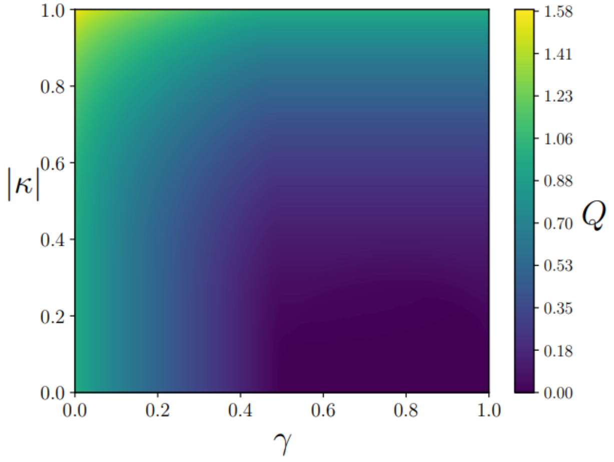
Partially Coherent Direct Sum Channels

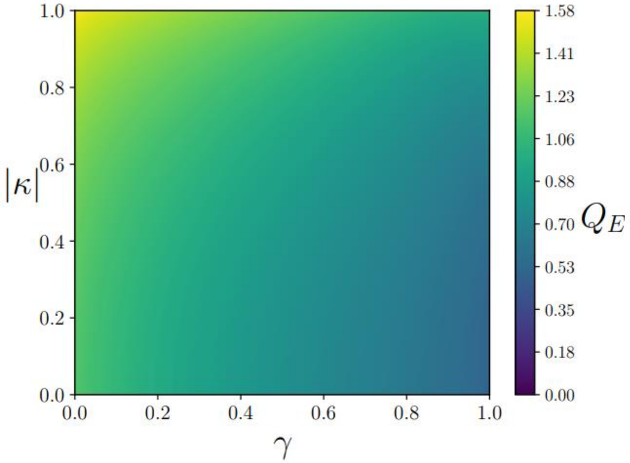
Stefano Chessa[1,*] and Vittorio Giovannetti[1]

[1] *NEST, Scuola Normale Superiore and Istituto Nanoscienze-CNR, I-56126 Pisa, Italy*

(Dated: August 5, 2020)

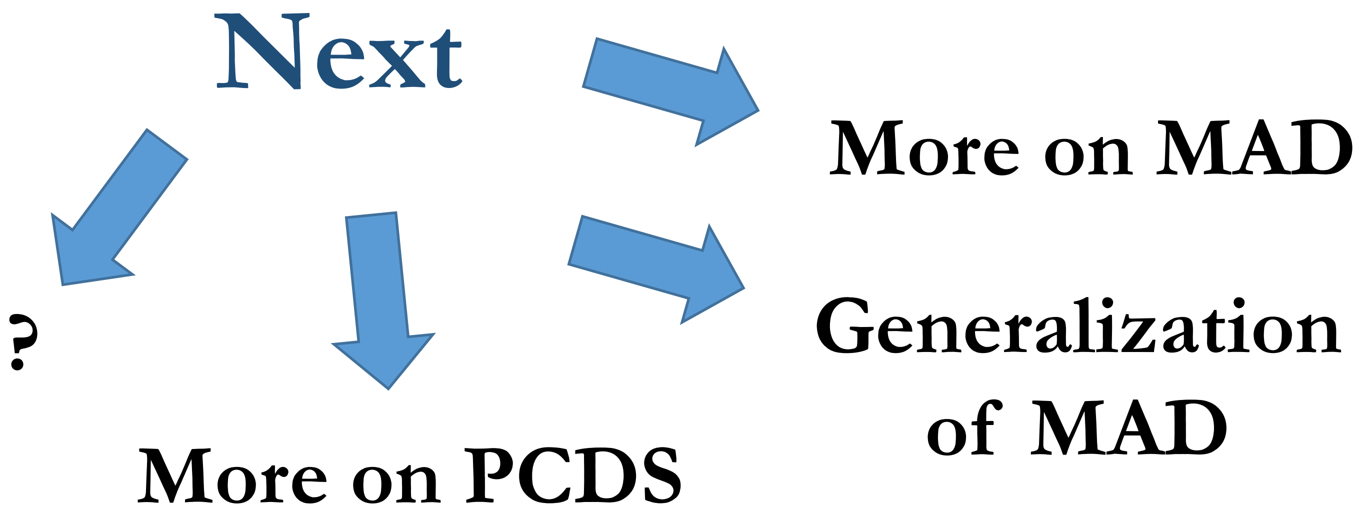
$$\Omega_{\mathrm{CC}}^{[\gamma](\kappa)}[\hat{\rho}_{\mathrm{CC}}] = \begin{pmatrix} \rho_{00} + \gamma\rho_{11} & \sqrt{1-\gamma}\rho_{01} & \kappa\rho_{02} \\ \sqrt{1-\gamma}\rho_{01}^{*} & (1-\gamma)\rho_{11} & \kappa\sqrt{1-\gamma}\rho_{12} \\ \kappa^{*}\rho_{02}^{*} & \kappa^{*}\sqrt{1-\gamma}\rho_{12}^{*} & \rho_{22} \end{pmatrix}$$





Research Project

- Research project
- Conferences



Research Project

- Research project
- Conferences

QIP 2020

TQC 2020

YIQIS 2020

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