Peter Hintz

IAMP Early Career Award

July 1, 2024

Peter Hintz

- Born: August 1991, Kassel (Germany)

Peter Hintz

- Born: August 1991, Kassel (Germany) a Kasselaner but not a Kasseläner.

Peter Hintz

- Born: August 1991, Kassel (Germany) a Kasselaner but not a Kasseläner.
- B.Sc's in Mathematics and Physics, Göttingen, 2011

Peter Hintz

- Born: August 1991, Kassel (Germany) a Kasselaner but not a Kasseläner.
- B.Sc's in Mathematics and Physics, Göttingen, 2011
- Ph.D. in Mathematics, Stanford, 2015, under direction of András Vasy

Peter Hintz

- Born: August 1991, Kassel (Germany) a Kasselaner but not a Kasseläner.
- B.Sc's in Mathematics and Physics, Göttingen, 2011
- Ph.D. in Mathematics, Stanford, 2015, under direction of András Vasy
- Miller Fellow, Berkeley, 2015–2017, under my nominal supervision

Peter Hintz

- Born: August 1991, Kassel (Germany) a Kasselaner but not a Kasseläner.
- B.Sc's in Mathematics and Physics, Göttingen, 2011
- Ph.D. in Mathematics, Stanford, 2015, under direction of András Vasy
- Miller Fellow, Berkeley, 2015–2017, under my nominal supervision
- Clay Research Fellow, 2017–2020

Peter Hintz

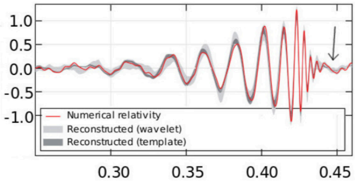
- Born: August 1991, Kassel (Germany) a Kasselaner but not a Kasseläner.
- B.Sc's in Mathematics and Physics, Göttingen, 2011
- Ph.D. in Mathematics, Stanford, 2015, under direction of András Vasy
- Miller Fellow, Berkeley, 2015–2017, under my nominal supervision
- Clay Research Fellow, 2017–2020
- Assistant Professor, MIT, 2019–2021

Peter Hintz

- Born: August 1991, Kassel (Germany) a Kasselaner but not a Kasseläner.
- B.Sc's in Mathematics and Physics, Göttingen, 2011
- Ph.D. in Mathematics, Stanford, 2015, under direction of András Vasy
- Miller Fellow, Berkeley, 2015–2017, under my nominal supervision
- Clay Research Fellow, 2017–2020
- Assistant Professor, MIT, 2019–2021
- Associate Professor of Mathematics and Physics, ETH, 2021–date

Peter Hintz, together with András Vasy, has been an architect of microlocal and dynamical systems tools for problems arising in general relativity

Peter Hintz, together with András Vasy, has been an architect of microlocal and dynamical systems tools for problems arising in general relativity



LIGO/Virgo collaboration, GW150914

$$u(t, x_{\text{detector}}) \sim \sum e^{-i\lambda_j t}, \quad t > 0.43\,\mathrm{s}$$

Some of the achievements

Some of the achievements

- Full nonlinear stability of slowly rotating Kerr–de Sitter black holes '18 (with Vasy).

Some of the achievements

- Full nonlinear stability of slowly rotating Kerr–de Sitter black holes '18 (with Vasy).

  The de Sitter black holes correspond to positive cosmological constant

Some of the achievements

- Full nonlinear stability of slowly rotating Kerr–de Sitter black holes '18 (with Vasy).

  The de Sitter black holes correspond to positive cosmological constant (it is positive – Nobel Prize '11 – but very small...)

Some of the achievements

- Full nonlinear stability of slowly rotating Kerr–de Sitter black holes '18 (with Vasy).

  The de Sitter black holes correspond to positive cosmological constant (it is positive – Nobel Prize '11 – but very small...)

- Study of quasinormal modes for black holes (including much cited physics papers, e.g. PRL '18 with Cardoso et al)

Some of the achievements

- Full nonlinear stability of slowly rotating Kerr–de Sitter black holes '18 (with Vasy).

  The de Sitter black holes correspond to positive cosmological constant (it is positive – Nobel Prize '11 – but very small...)

- Study of quasinormal modes for black holes (including much cited physics papers, e.g. PRL '18 with Cardoso et al)

- Black hole gluing in de Sitter space '21–'24

Some of the achievements

- Full nonlinear stability of slowly rotating Kerr–de Sitter black holes '18 (with Vasy).

  The de Sitter black holes correspond to positive cosmological constant (it is positive – Nobel Prize '11 – but very small...)

- Study of quasinormal modes for black holes (including much cited physics papers, e.g. PRL '18 with Cardoso et al)

- Black hole gluing in de Sitter space '21–'24

- Linear Stability of Kerr Black holes '21 (with Häfner and Vasy)

Some of the achievements

- Full nonlinear stability of slowly rotating Kerr–de Sitter black holes '18 (with Vasy).

  The de Sitter black holes correspond to positive cosmological constant (it is positive – Nobel Prize '11 – but very small...)

- Study of quasinormal modes for black holes (including much cited physics papers, e.g. PRL '18 with Cardoso et al)

- Black hole gluing in de Sitter space '21–'24

- Linear Stability of Kerr Black holes '21 (with Häfner and Vasy)

- A sharp version of Price's law for wave decay on asymptotically flat spacetimes '22

Some of the achievements

- Full nonlinear stability of slowly rotating Kerr–de Sitter black holes '18 (with Vasy).

  The de Sitter black holes correspond to positive cosmological constant (it is positive – Nobel Prize '11 – but very small...)

- Study of quasinormal modes for black holes (including much cited physics papers, e.g. PRL '18 with Cardoso et al)

- Black hole gluing in de Sitter space '21–'24

- Linear Stability of Kerr Black holes '21 (with Häfner and Vasy)

- A sharp version of Price's law for wave decay on asymptotically flat spacetimes '22

- 1st violin Stanford Symphony Orchestra '13–'15, 2nd violin UC Berkeley Symphony Orchestra '15–'16

A sample theorem:

A sample theorem: a baby version of sharp Price's law

A sample theorem: a baby version of sharp Price's law

$$(\partial_t^2 - \Delta_{\mathbb{R}^3} + V)\varphi = 0, \quad \varphi|_{t=0},\ \partial_t\varphi|_{t=0} \in C_c^\infty(\mathbb{R}^3)$$

A sample theorem: a baby version of sharp Price's law

$$(\partial_t^2 - \Delta_{\mathbb{R}^3} + V)\varphi = 0, \quad \varphi|_{t=0},\ \partial_t\varphi|_{t=0} \in C_{\mathrm{c}}^\infty(\mathbb{R}^3)$$

$$V(x) = \frac{1}{|x|^3} W\left(\frac{1}{|x|}, \frac{x}{|x|}\right), \ \ |x| > 1, \ \ W \in C^\infty([0,1)\times\mathbb{S}^2; [0,\infty))$$

A sample theorem: a baby version of sharp Price's law

$$(\partial_t^2 - \Delta_{\mathbb{R}^3} + V)\varphi = 0, \quad \varphi|_{t=0},\ \partial_t\varphi|_{t=0} \in C_{\mathrm{c}}^\infty(\mathbb{R}^3)$$

$$V(x) = \frac{1}{|x|^3} W\left(\frac{1}{|x|}, \frac{x}{|x|}\right), \ \ |x| > 1, \ \ W \in C^\infty([0,1)\times\mathbb{S}^2; [0,\infty))$$

Then

$$\varphi(t,x) = cU(x)t^{-3} + \mathcal{O}_K(t^{-4+\varepsilon}), \quad x \in K \Subset \mathbb{R}^3,$$

A sample theorem: a baby version of sharp Price's law

$$(\partial_t^2 - \Delta_{\mathbb{R}^3} + V)\varphi = 0, \quad \varphi|_{t=0},\ \partial_t\varphi|_{t=0} \in C_c^\infty(\mathbb{R}^3)$$

$$V(x) = \frac{1}{|x|^3} W\left(\frac{1}{|x|}, \frac{x}{|x|}\right), \ \ |x| > 1, \ \ W \in C^\infty([0,1)\times\mathbb{S}^2; [0,\infty))$$

Then

$$\varphi(t,x) = cU(x)t^{-3} + \mathcal{O}_K(t^{-4+\varepsilon}), \quad x \in K \Subset \mathbb{R}^3,$$

where

$$(\Delta_{\mathbb{R}^3} + V)U = 0, \ \ U \to 1, \quad c := -\frac{1}{4\pi^2}\langle \partial_t\varphi|_{t=0}, U\rangle \int_{\mathbb{S}^2} W(0,\omega)d\omega$$

A sample theorem: a baby version of sharp Price's law

$$(\partial_t^2 - \Delta_{\mathbb{R}^3} + V)\varphi = 0, \quad \varphi|_{t=0},\ \partial_t\varphi|_{t=0} \in C_c^\infty(\mathbb{R}^3)$$

$$V(x) = \frac{1}{|x|^3} W\left(\frac{1}{|x|}, \frac{x}{|x|}\right), \quad |x| > 1, \quad W \in C^\infty([0,1) \times \mathbb{S}^2; [0,\infty))$$

Then

$$\varphi(t,x) = cU(x)t^{-3} + \mathcal{O}_K(t^{-4+\varepsilon}), \quad x \in K \Subset \mathbb{R}^3,$$

where

$$(\Delta_{\mathbb{R}^3} + V)U = 0, \quad U \to 1, \quad c := -\frac{1}{4\pi^2}\langle \partial_t\varphi|_{t=0}, U\rangle \int_{\mathbb{S}^2} W(0,\omega)\,d\omega$$

Peter Hintz, IAMP Early Career Award 2024