

# MA876 - PDE Seminar - Spring 2018

## Contact Info

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Office Hours:	Mondays 2:30-3:30pm and Thursdays 3:30-4:30pm, or by appointment
Class details:	11:00-12:15am TR in CAS 314
Website:	<a href="http://math.bu.edu/people/mabeck/Spring18/MA876.html">http://math.bu.edu/people/mabeck/Spring18/MA876.html</a>

## Topics Covered

This course will focus on methods for determining the point spectrum of linear operators associated with nonlinear waves. I will begin with motivation and an introduction to the relevant aspects of spectral theory. Next I will introduce the Evans function, and discuss in particular how it can be used to study slow-fast systems and perturbations of eigenvalues. As time permits I will also discuss recent developments in spatial dimensions greater than one. (Note: these topics are tentative and subject to change as the semester progresses.)

## Course Format

I will give the lectures at least until Spring Break. The remaining lectures will be given by participants in the course. If you are taking the course for credit, you are required to give at least two lectures, and your grade will be based entirely on these lectures. If you are auditing the course it is up to you whether or not you give lectures, but please let me know by February 14 whether or not you wish to do so. The topic of your lectures can be anything you like that is related to the point spectrum of linear operators associated with nonlinear waves. I'm happy to discuss your interests with you and suggest a topic, if you wish.

## Important Dates

Item	Date
Initial discussion with me regarding your lecture topic	by February 14.
Topic finalized and availability of dates for your lectures submitted	by February 28.
(at least) Two lectures	TBD, after Spring Break.

## Suggested reading

You do not need to buy any books. The following may be of interest:

- Henry, Dan. "Perturbation of the boundary in boundary-value problems of partial differential equations." London Mathematical Society Lecture Note Series, 318. Cambridge University Press, Cambridge, 2005. <https://mathscinet.ams.org/mathscinet-getitem?mr=2160744>
- Kapitula, T. "Stability analysis of pulses via the Evans function: dissipative systems." Dissipative solitons, 407428, Lecture Notes in Phys., 661, Springer, Berlin, 2005. <https://mathscinet.ams.org/mathscinet-getitem?mr=2174303> A .pdf of the paper can be found on Todd's webpage: <http://www.calvin.edu/~tmk5/research/OnlineReviewArticle.pdf>

- Kapitula, Todd and Promislow, Keith. "Spectral and dynamical stability of nonlinear waves." Applied Mathematical Sciences, 185. Springer, New York, 2013. <https://mathscinet.ams.org/mathscinet-getitem?mr=3100266>
- Sandstede, Björn. "Stability of travelling waves." Handbook of dynamical systems, Vol. 2, 9831055, North-Holland, Amsterdam, 2002. <https://mathscinet.ams.org/mathscinet-getitem?mr=1901069>  
A .pdf of the paper can be found on Björn's webpage: <http://www.dam.brown.edu/people/sandsted/publications/survey-stability-of-waves.pdf>
- Sandstede, Björn, "The Evans function: An example." <http://www.dam.brown.edu/people/sandsted/documents/evans-function-example.pdf>