

# Echolocation in Whales, Bats and Man

A Workshop at the  
**University of Southern Denmark**

Marine Field Laboratory, Hindsholmsvej 11, 5300 Kerteminde, Denmark,  
and Institute of Biology, Campusvej 55, Odense M

**from the 30th of June to the 9<sup>th</sup> of July, 2010**

Funded by the Danish National Research Council  
the Danish Research School SNAK  
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and Friluftsrådet

Organized by Magnus Wahlberg, University of Southern Denmark and Fjord&Bælt,  
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## **Invited Lecturers:**

Annemarie Surlykke (AMS), University of Southern Denmark, Denmark  
Christian Brandt (CB), University of Southern Denmark, Denmark  
Colleen Reichmuth (CR), Long Marine Laboratory, University of California Santa Cruz, USA  
Daniel Kish (DK), World Access for the Blind, USA  
Herbert Peremans (HP), University of Antwerp, Belgium  
Juan Antonio Rojas (JR), University of Alcala, Spain  
Kristian Beedholm (KB), Aarhus University, Denmark  
Lutz Wiegrebe (LW), University of Munich, Germany  
Magnus Wahlberg (MW), University of Southern Denmark and Fjord&Bælt, Denmark  
Paul Nachtigall (PN), Hawaii Institute of Marine Biology, University of Hawaii, USA  
Peter Teglberg Madsen (PTM), Aarhus University, Denmark  
Sven Schörmich (SVS), University of Munich, Germany  
Tue Skovgaard Larsen (TS), Fjord&Bælt, Denmark

**PROGRAM (Subject to changes)****Wednesday 30<sup>th</sup> of June (Marine Biological Laboratory, Kerteminde)**

- 9.00 - 10.00 MW: Workshop opening remarks  
 10.00 - 11.00 PN: What is and what is not echolocation?  
 11.00 - 11.30 Coffee break  
 11.30 - 12.30 PN: Echolocation and hearing in dolphins  
 12.30 - 13.30 Lunch  
 13.30 - 15.30 Visit at Fjord&Bælt
- 13.30 MW: Guided tour
  - 14.30 Hearing experiment with harbour porpoise
  - 15.00 Presentation of seals and porpoises
- 15.30 - 16.00 Coffee break  
 16.00 - 17.00 PTM: Echolocation in toothed whales  
 19.00 Opening reception and dinner, spontaneous bar

**Thursday 1<sup>st</sup> of July (Marine Biological Laboratory, Kerteminde)**

- 9.00 - 11.00 AMS: Echolocation in bats  
 11.00 - 12.00 MW: Echolocation in insects, birds and fish  
 12.00 - 13.00 Lunch  
 13.00 - 16.00 DK: Echolocation in humans  
 19.00 Dinner and spontaneous bar

**Friday 2<sup>nd</sup> of July (Marine Biological Laboratory, Kerteminde)**

- 9.00 - 10.00 HP: The automated echolocator  
 10.00 - 11.00 LW and SvS: Human echolocation  
 11.00 - 12.00 JR: Aided designs for blind echolocation  
 12.00 - 13.00 Lunch  
 13.00 - 14.00 CR: Training techniques in psychophysics  
 14.00 - 16.00 DK, JR: Practical techniques in echolocation of man  
 19.00 Dinner and spontaneous bar

**Saturday 3<sup>rd</sup> of July (Marine Biological Laboratory, Kerteminde)**

- 10.00 - 11.00 DK: Echolocation in the education of the blind  
 11.00 - 12.00 Discussion on public outreach of echolocation in humans
- Coordinated educational programs
  - International networking
- 12.00 - 13.00 Lunch  
 13.00 - 16.00 Continued discussions and exercises on public outreach activities for the blind
- TS Beach, boat and diving excursion
- 19.00 Dinner and spontaneous bar

**Sunday 4<sup>th</sup> of July**

Free day for touring the area, and for further discussions among workshop participants.

Excursion to Svendborg (only a limited number of seats available):

- Visiting the sailing boat Gunnlög, sailed by visually impaired sailors
- Visiting the Naturama exhibit centre <http://www.naturama.dk/>

You can also visit some great attractions in the Kerteminde area:

- Johannes Larsen Museum, beautiful art museum <http://www.johanneslarsenmuseet.dk/>
- The Viking boat museum in Ladby, <http://www.vikingemuseetladby.dk/page.asp?contentsection=DB128ABC869543089A2A7C18AD540A72&zcs=2191>
- There are many possibilities for beautiful bike rides and walks in the town, and also in the beautiful forests and beaches nearby. For lending bikes (or why not a kajak), please ask the organizers.

- 19.00 Dinner and spontaneous bar at the Marine Lab in Kerteminde

**Monday 5<sup>th</sup> of July (Lecture room U26A, University of Southern Denmark, Odense campus)**

- 9.00 – 10.00 PN and CR: Psychophysical and physiological techniques in hearing studies  
10.00 – 11.00 PN and CR: Hearing in dolphins: the importance of attention  
11.00 -11.30 Coffee break  
11.30 - 12.30 AS: Hearing in bats  
12.30 - 13.15 Lunch  
13.15 – 14.00 CB: Hearing in humans  
14.00 – 18.00 CB, PN, KB CR: Practical trials on human hearing (4 rotating stations of an hour each)
- Auditory Brainstem Response measurements
  - Psychophysical thresholds of hearing (Go- no go)
  - Masking of hearing: Critical bands, Critical Ratios
  - Integration time
- 18.30 Departure to Kerteminde  
19.00 Dinner and spontaneous bar at the Marine Lab in Kerteminde

**Tuesday 6<sup>th</sup> of July (Kerteminde and campus)**

The workshop is split into groups working on the following topics:

*Kerteminde:*

PN, CR: Discussions and practical trials on marine mammal training in echolocation studies

- Echolocation and hearing studies in harbour porpoises
- Hearing and other studies of harbour seals

*University of Southern Denmark Campus*

AS Discussions and practicals on echolocation in bats

CB Continued investigations in the hearing abilities of humans: the importance of attention

19.00 Dinner and spontaneous bar at the Marine Lab in Kerteminde

**Wednesday 7<sup>th</sup> of July (Kerteminde and campus)**

Similar program as Tuesday

19.0 Dinner and spontaneous bar at the Marine Lab in Kerteminde

20.0 MW: Wrap-up, evaluation and farewell

**Thursday 8<sup>th</sup> of July**

DK and MW travel to Munich, Germany (DK, MW).

For the rest of the workshop participants, there is further time for discussions and studies of target species

**Friday 9<sup>th</sup> of July (Munich)**

All day MW, DK, LW: Scanner study, Munich

**PARTICIPANTS**

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## Practical info

### Venue

Most of the days you will spend at the Marine Biological Laboratory, Hindsholmsvej 11, 5300 Kerteminde. Kerteminde is easily accessible either by bus 150 (busses run more or less 2-3 times an hour; they are always delayed so no use in supplying bus schedule) from the *Odense banegård* (Odense train station), or by car from several exits marked Kerteminde on the E45 highway between Odense and Nyborg.

You may also spend a day or two on campus, at University of Southern Denmark, Campusvej 55, 5230 Odense M, in lecture room U26A and in the laboratory of Christian Brandt, Biological Institute. There is transportation arranged from Kerteminde to campus and back again. You can get a map over the SDU campus at the main entrance of the university, or ask for directions at the information desk of SDU (this lecture room is a bit tricky to find...).



Map over downtown Kerteminde



University of Southern Denmark is situated at the symbol A. Ask in the main entrance for the way to the seminar room U26A.

### Invited contributors of talks and demonstrations (see list above):

Many of you will stay at Tormøes Hotel in Kerteminde (Strandgade 2; see map above). You will eat breakfast at the hotel from 7-10 AM. Lunch will usually be pre-made sandwiches at the lab. Dinner will be served at the Marine Laboratory.

For participants *not* contributing material to the workshop

There are several lodging options available but you need to contact Magnus to check out price ranges and bookings.

If you want to join in for lunches and dinners, there will be a daily cost of 40DKK for lunch and 80 DKK for dinner. Please indicate beforehand if you are interested in this, and if you have special requests (vegetarian, et cetera). *All ordering for lunches and dinners need to be made no later than Monday 28<sup>th</sup> of June to [henriette.b.schack@gmail.com](mailto:henriette.b.schack@gmail.com)* For those of you who have already ordered lunch and dinners to Magnus, please reiterate your order to Henriette to avoid any misunderstandings.

**Media**

Some selected journalists and film makers have been invited to cover the workshop. They have all been asked not to interfere too much with the workshop agenda, but you may all be invited to participate in interviews and demonstrations and are of course very welcome to do so.

Up to date we have the following media joining us:

- Fyns Stiftstidene, 30<sup>th</sup> of June, afternoon
- Mette Lund, Weekendavisen, interviews and porpoise experiment, 30<sup>th</sup> of June - 2<sup>nd</sup> of July
- Julien Naar, France, filming Daniel and porpoise training, 5<sup>th</sup> - 8<sup>th</sup> of July
- Samantha Lewis, BBC, Filming the Munich scanner study, 8<sup>th</sup> - 9<sup>th</sup> of July

Possibly other local newspaper, TV and radio media may show up for the workshop

