



**HAL**  
open science

## **DEBSe@: an e-learning platform to introduce the Dynamic Energy Budget (DEB) theory for marine ecology, fisheries sciences and aquaculture applications**

Yoann Thomas, Fred Jean, Laure Pecquerie, Gonçalo Marques, Sébastien Hervé, Valérie Dantec, Jonathan Flye-Sainte-Marie

### ► To cite this version:

Yoann Thomas, Fred Jean, Laure Pecquerie, Gonçalo Marques, Sébastien Hervé, et al.. DEBSe@: an e-learning platform to introduce the Dynamic Energy Budget (DEB) theory for marine ecology, fisheries sciences and aquaculture applications. International Society for Ecological Modelling - Global Conference 2016, May 2016, Baltimore, United States. 2016, 10.13140/RG.2.2.32880.25602 . hal-01395769

**HAL Id: hal-01395769**

**<https://hal.univ-brest.fr/hal-01395769v1>**

Submitted on 11 Nov 2016

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# DEBSe@ : an e-learning platform to introduce the Dynamic Energy Budget (DEB) theory for marine ecology, fisheries sciences and aquaculture applications



Yoann Thomas<sup>1</sup>, Laure Pecquerie<sup>2</sup>, Frédéric Jean<sup>1</sup>, Gonçalo Marques<sup>3</sup>, Sébastien Hervé<sup>1</sup>, Valérie Dantec<sup>4</sup>, Jonathan Flye-Sainte-Marie<sup>1</sup>

<sup>1</sup> Université de Bretagne Occidentale, UMR LEMAR - 6539 CNRS/UBO/IRD/Ifremer, France  
<sup>2</sup> Institut de Recherche pour le Développement, UMR LEMAR - 6539 CNRS/UBO/IRD/Ifremer, France  
<sup>3</sup> Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal  
<sup>4</sup> Université de Bretagne Occidentale, SIAME, France

## Context

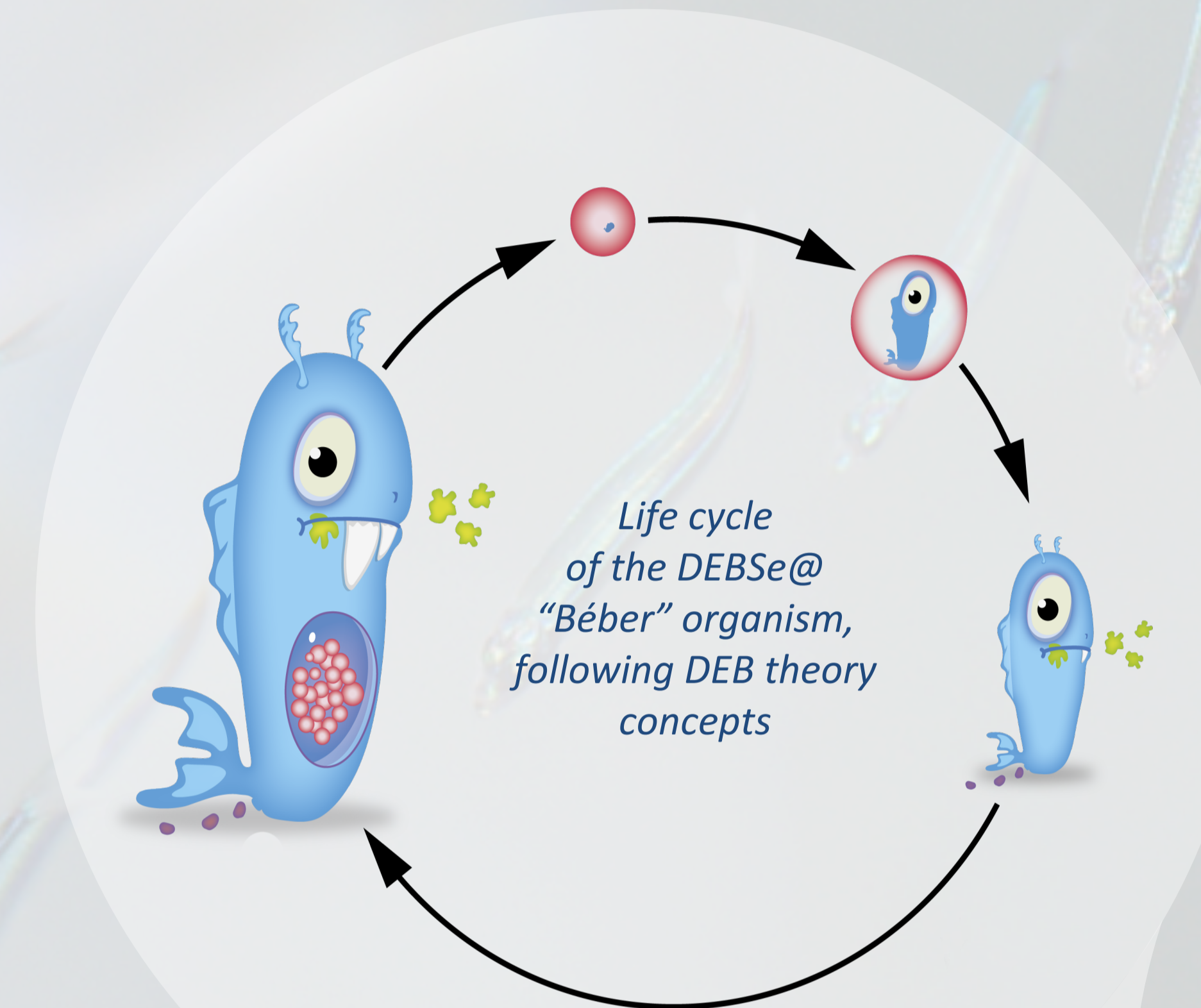
DEBSe@ provides an introductory course on **Dynamic Energy Budget (DEB) theory** to master and PhD students in **marine biological sciences** worldwide.

DEBSe@ follows a **flipped classroom** concept, with:

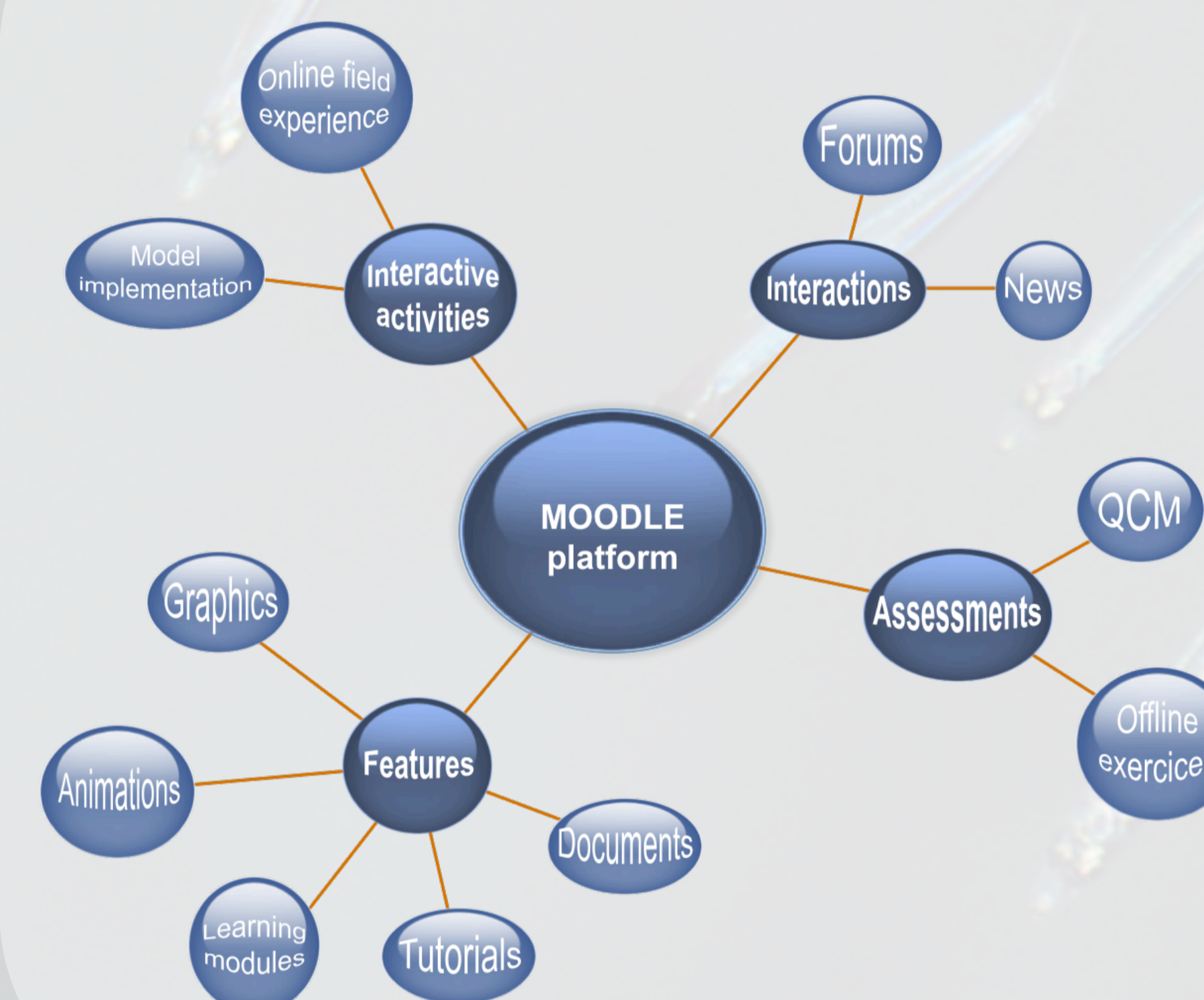
- an **international** Small Private Online Course (**SPOC**) followed by
- a class in presence of a teacher to apply what have been learned and to go to higher-order tasks

The online course will be available in French, Spanish and English from the **MOODLE platform** managed by the **Université de Bretagne Occidentale** (UBO, Brest, France).

DEBSe@ is complementary to the Massive Open Online DEB-Course (DEB-MOOC<sup>a</sup>, Akvaplan-Niva, Norway and IST, Portugal), targeting advanced researchers and PhD students.



## Content of the online course



- Online course platform: MOODLE
- Access area tailored to individual student
- Auto-assessment
- Several asset-based materials (graphics, animations etc.)
- Interactive activities (see below)
- Service-based features (online assessments, forums, news etc.)
- External links (Web pages, books, published articles etc.)
- Feedback on the course enabling its improvement

## Learning modules

### Basics of

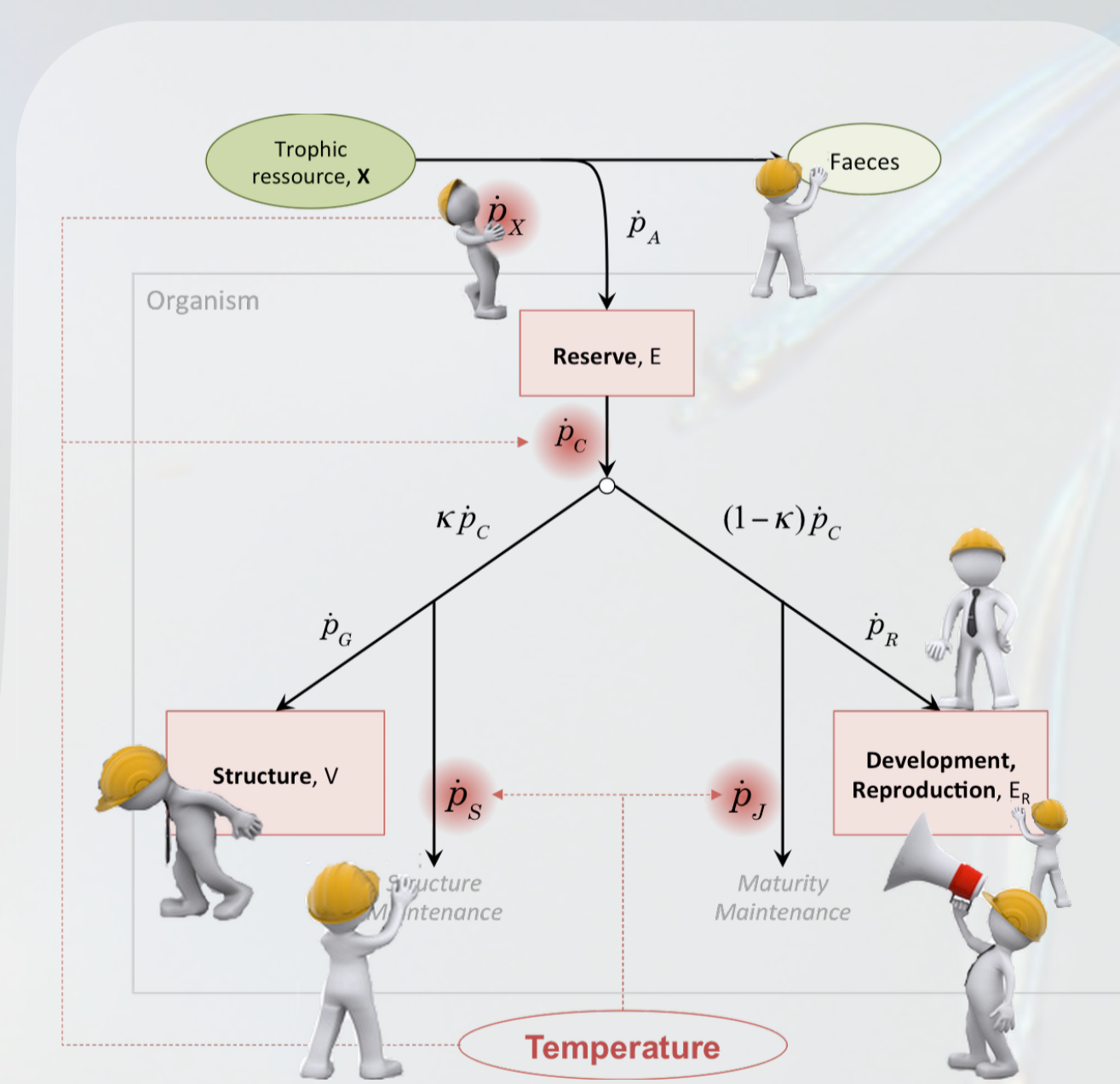
Compartment models in biology  
 Numerical integration methods  
 Programming in R

### DEB theory

Concepts  
 &  
 Building a standard model with R

### First simulations

with the DEB model and a theoretical data set generated during the serious-game "Béber project"



Conceptual scheme of the DEB model under construction, illustrating one of the learning module of the course

## Serious-game "Béber project"

A virtual field experience

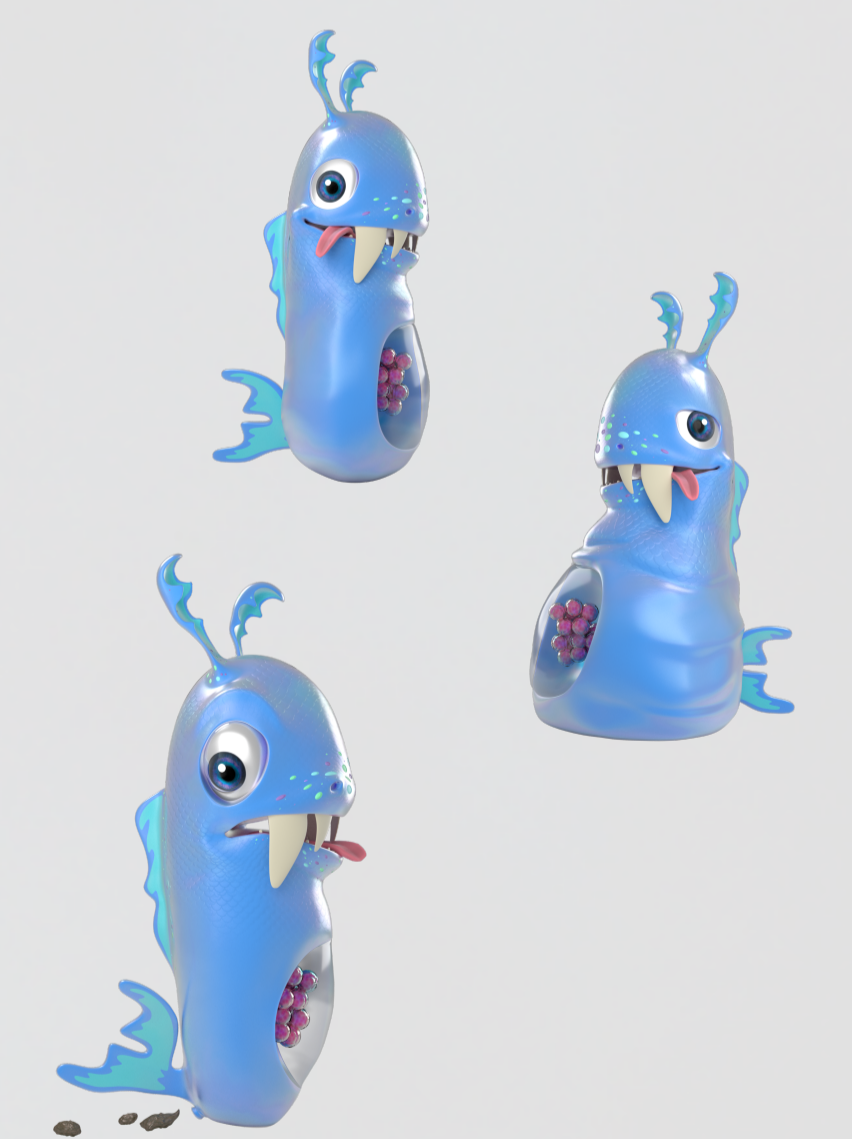
### Concept:

Rearing individuals from a cohort of DEBSe@ organisms (see Figures) that will grow, develop and reproduce following the rules of the standard DEB model, according to the environmental conditions defined by students. Each student will create its own data set and then will use it:

- for the first application of the DEB model build with R.
- to learn how to estimate the parameters using the *add-my-pet* procedure<sup>a</sup> and the *DEBtool* routines, recently translated in R.

### Objectives:

- To stimulate the course interactivity.
- To create a personal dataset (environmental and biometric time-series).



3D-animations will be available to illustrate the various state and processes (feeding, growth etc.) of the DEBSe@ "Béber" organism

## Practical information

**Course schedule:** two sessions of 4 to 5 weeks will be open every years for the online course, followed by a class time of two weeks.

**Target audience:** Master and PhD students & researchers who might be interested in an introductory course on DEB theory.

**Contacts:** For more information, please contact [jonathan.flye@univ-brest.fr](mailto:jonathan.flye@univ-brest.fr) ; [laure.pecquerie@ird.fr](mailto:laure.pecquerie@ird.fr)

<sup>a</sup><http://www.debtheory.org/>