

# Advanced Elmer/Ice Workshop

22 – 24 Novembre 2017

## Introduction

Olivier GAGLIARDINI (IGE, France)

Fabien GILLET-CHAULET (IGE, France)

Thomas ZWINGER (CSC, Finland)

LabEx OSUG 2020



# Program - Day 1

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## Wednesday, 22 Nov 2017 – bat Galilée

8h30-9h00 - Arrival of the participants

9h00-9h30 - Introduction words + round-table presentation (Olivier)

9h30-10h00 - Lower-order Stokes model (Fabien)

10h00-10h30 - Thermal regime of glacier (Adrien)

10h30-11h00 - Coffee break

11h00-11h30 - Calving models in Elmer (Thomas)

12h00 Lunch (on your own expense)

13h30-14h00 - Inverse methods for ice flow (Fabien)

14h00-14h30 - Inverse methods for bed geometry (Johannes)

14h30-15h00 - Parallel computing (Thomas)

15h00-15h30 Coffee break

16h00-16h30 - Hydrology and friction (Olivier)

16h30-17h00 - Marine ice sheet/glacier and grounding line dynamics (Olivier)

19h30 Dinner at La ferme à Dédé (on you own expense)

# Program - Day 2

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## Thursday, 23 Nov 2017 – bat Galilée

9h00-10h00 - Ocean and ice coupling (Rupert & Nico)

10h00-10h30 - Programming your own solver/user functions (Thomas)

10h30-11h00 Coffee break

11h00-11h30 - Pre-processing (geometry, meshing) and Post-processing (Thomas)

11h30-12h00 - Development of a LevelSet approach to model complex biphasic media (Kevin)

12h00-13h30 Lunch (on your own expense)

13h30-14h00 – Remeshing (Fabien)

14h00-14h30 - Contributing code to Elmer(/Ice), Defensive programming (Rupert)

14h30-15h00 - Rate and state friction law for hard bed glaciers (Kjetil)

15h00-15h30 Coffee break

15h30-16h00 - 3D Modelling of ice rises in East Antarctica (Clemens)

16h00-16h30 - Ice flow modelling to constrain SMB and ice discharge in Patagonia (Gabriela)

16h30-17h00 – Modelling permafrost (Denis)

19h30 Dinner at Chez Marius (on your own expense)

# Program - Day 3

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Friday, 24 Nov 2017 – IGE glaciology

9h00-12h00 Hands on to participants problems

12h00-13h30 Lunch (on you own expense)

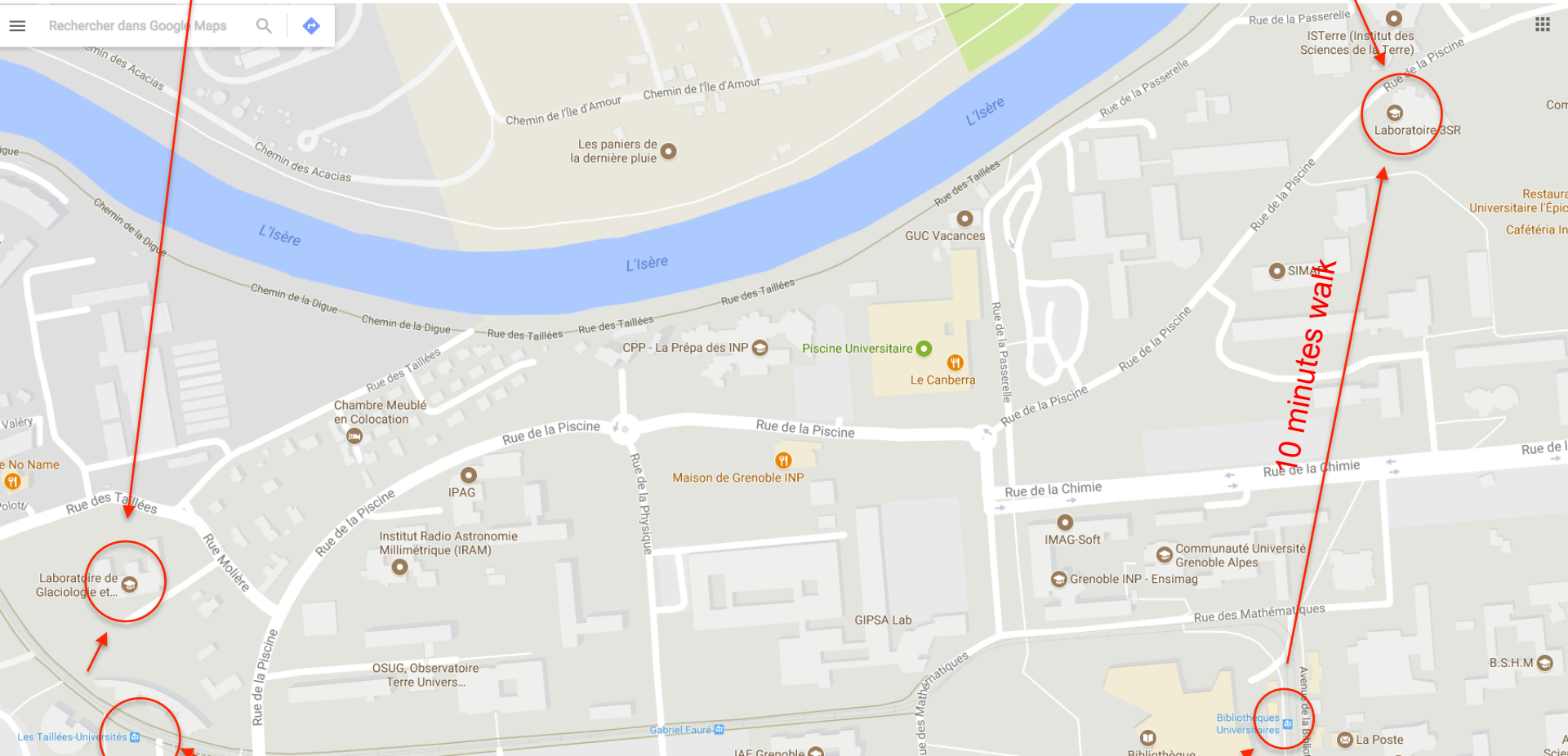
13h30-15h30 Hands on to participants problems

15h30-16h30 Discussion about future plans, future developments, form of this workshop, etc...

16h30 End of the workshop

3<sup>rd</sup> day: IGE  
glaciology (ex LGGE)

1<sup>st</sup> and 2<sup>nd</sup> day:  
Galilée building



Tram B stop “Les Taillées-Universités” or C stop  
“Hector Berlioz-Universités”

Tram B or C stop  
“Bibliothèques Universitaires”

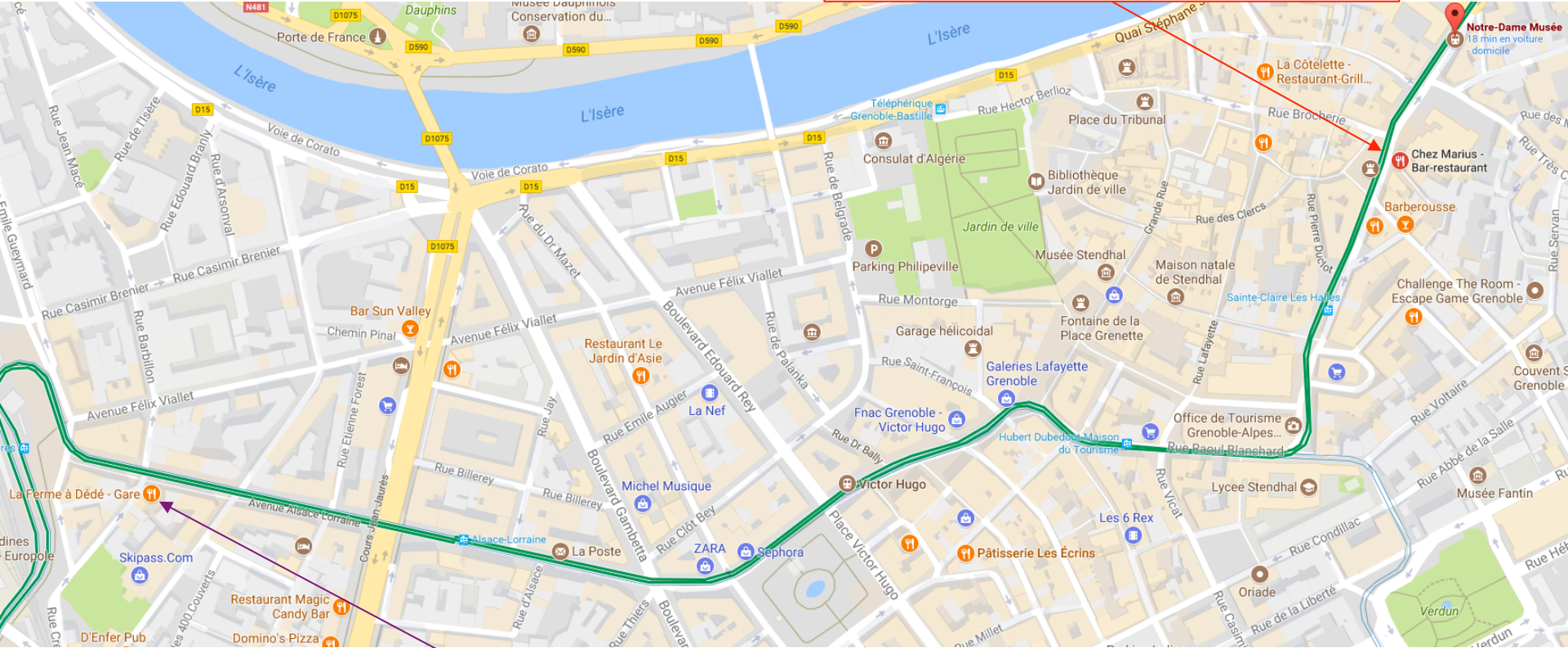
# Lunch





# Dinners (For those who have booked)

Thursday 19h30 - Chez Marius  
1 place Notre Dame



Wednesday 19h30 - La ferme à Dédé  
55 Avenue Alsace Lorraine

# Short history of Elmer/Ice (not anymore so short...) 1/2

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- ✓ EGU2002: OG was looking for a 3D FE code to model the flow of strain-induced anisotropic polar ice – meet TZ
- ✓ March 2003: OG visited CSC for few days: AIFlowSolver and FabricSolver partly implemented
- ✓ August 2005 – One year visit of OG at CSC (Anisotropy, cavity, glaciers, ISMIP tests, ...)
- ✓ February 2008 – First Elmer/Ice Course - Grenoble
- ✓ June 2011 – SVALI summer school – Finland
- ✓ 2012 – Elmer/Ice has now a website, a logo and a mailing list
- ✓ 2012 – Elmer/Ice comes as a Elmer Package – New wiki
- ✓ 2012 – Elmer/Ice course at UBC/SFU
- ✓ 2013 – Elmer/Ice courses at Univ. Washington and Univ. Alberta
- ✓ 9 April 2013 – First Elmer/Ice users meeting – EGU 2013
- ✓ May 2013 – Second SVALI summer school – Finland



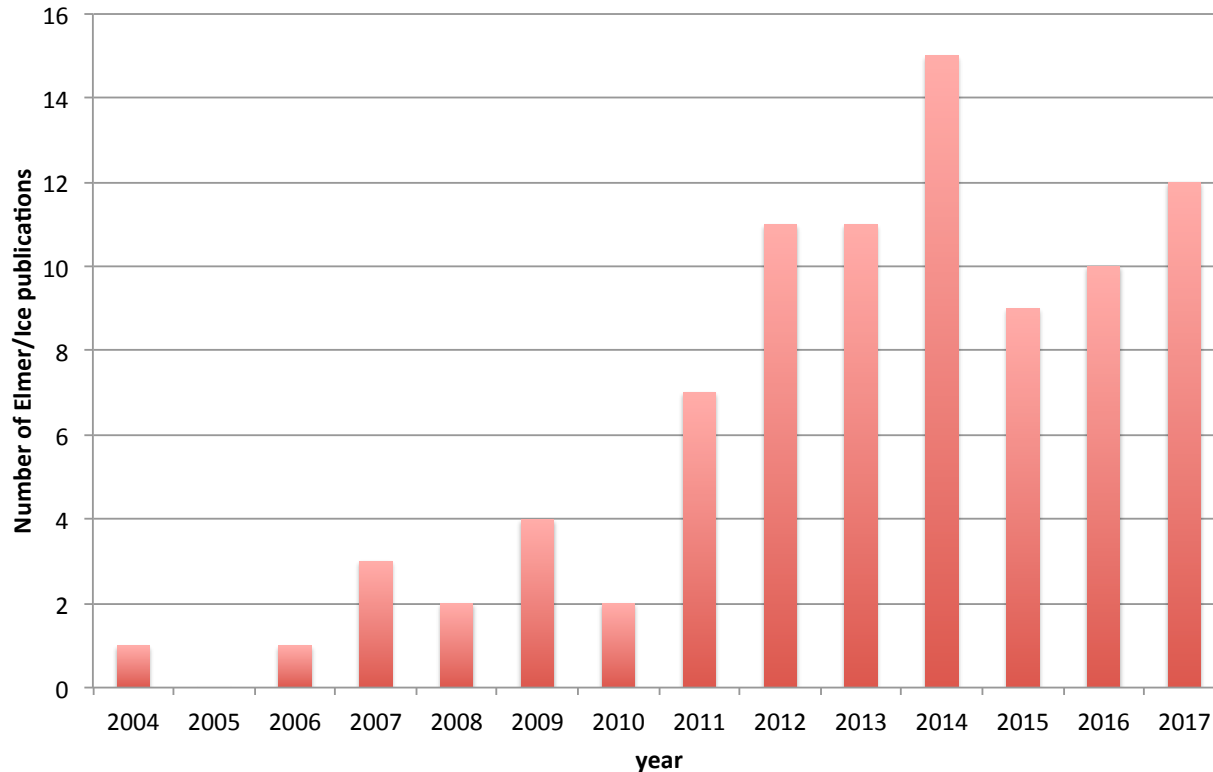
# Short history of Elmer/Ice (not anymore so short...) 2/2

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- ✓ 2-day beginner Elmer/Ice course, 3-4 Oct. 2013, LGGE, Grenoble, France
- ✓ 3-day Elmer/Ice advanced workshop, 4-6 Nov. 2013, CSC, Espoo, Finland
- ✓ April 2014 – Second Elmer/Ice users meeting – EGU 2014
- ✓ 3-day beginner Elmer/Ice course, 27-29 Oct. 2014, IMO, Reykjavík, Iceland
- ✓ April 2015 – Third Elmer/Ice users meeting – EGU 2015
- ✓ 2-day beginner Elmer/Ice course, 2-3 Nov. 2015, CIC, NBI, Copenhagen, Denmark
- ✓ 3-day Elmer/Ice advanced workshop, 30 Nov, 1&2 Dec 2015, LGGE, Grenoble, France
- ✓ 3-days beginner course, Oct 2016, Oslo
- ✓ April 2017 – Fourth Elmer/Ice users meeting – EGU 2017
- ✓ 2-day beginner Elmer/Ice course, 23&24 October 2017, Srockholm

and now a new advanced 3-day workshop at IGE

# A growing community



14 Courses ~ 240 participants

4 Elmer/Ice users meetings

88 publications

Since few years, first authors are not only anymore only from CSC or IGE (ex LGGE)...

**elmer ice** NEWS PUBLICATIONS CAPABILITIES USERS COMMUNITY FORUM COURSES TUTORIALS MATERIALS DOCUMENTATIONS

search...

Elmer/Ice New beginner Elmer/Ice course

## Elmer/Ice

Open Source Finite Element Software for Ice Sheet, Glaciers and Ice Flow Modelling

Elmer/Ice is a full-Stokes, finite element, ice sheet / ice flow model. The aim of this website is to present the capabilities of Elmer/Ice and to distribute course materials and tutorials.

Elmer/Ice builds on Elmer, the open-source, parallel, finite element code, developed by the CSC-IT Center for Science Ltd. in Finland. Elmer/Ice is mainly developed by CSC-IT Center for Science Ltd., the LGGE and ILTS, but others contributors are welcome!

## New beginner Elmer/Ice course

Written by [Olivier Gagliardini](#).

**SVALI Elmer/Ice course, Reykjavik, Iceland, October 27-28, 2014**

IMO in cooperation with CSC (Finland) and LGGE (France) will organize a 2-day Elmer/Ice course on the 27th and 28th of October 2014, just before the **Nordic Branch IGS meeting** in Iceland. The course is intended for persons who want to start using Elmer/Ice in their research projects with an option to go into special details on the second day. The course is sponsored by the Nordic Centre of Excellence, **SVALI**. There are in maximum 18 seats which by preference will be offered to SVALI members. The rest of the seats are given on a first-come-first-get principle. The course itself is free of charge. Participants are responsible for their own accommodation and travel (see instructions below). Further it is expected, that participants bring along their own laptop with a working Elmer/Ice environment installed (instructions will follow later).

Lectures are in English.  
Lecturers: Olivier Gagliardini, Thomas Zwinger.  
Venue: IMO, Bústaðavegur 9, Reykjavik.  
Travel: For air travel to Iceland see "icelandair.com" and "dohop.com" (further instructions about how to get to the IMO will follow later).  
Accommodation: For reasonably priced guesthouses check "kexhostel.is/" and "guesthousereykjavik.com/".  
Registration: By email to Anna Sinisalo (a.k.sinisalo[at]geo[dot]juo[dot]no), latest by 11th October, 2014.

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### Latest News

- [A thermal regime model for polythermal glaciers](#)
- [New beginner Elmer/Ice course](#)
- [How old is the ice beneath Dome A, Antarctica?](#)
- [Elmer/Ice at IGS Charmonix 2014](#)
- [Environmental influences on the calving behaviour of Helheim](#)

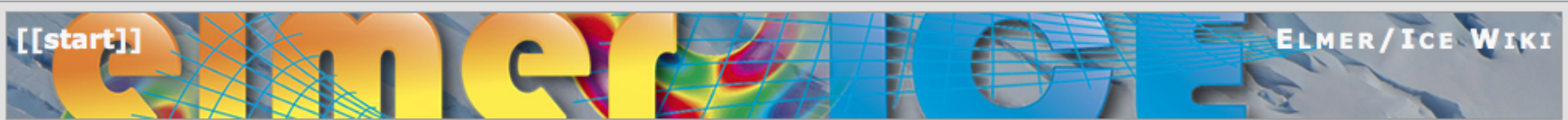
### Tweets

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**Elmer/Ice** @ElmerIce1 26 Aug  
New beginner Elmer/Ice course  
[elmerice.elmerfem.org/45-new-beginne...](http://elmerice.elmerfem.org/45-new-beginne...)  
Expand

**Elmer/Ice** @ElmerIce1 21 Aug  
A new beginner Elmer/Ice ice course in Iceland, end of October. Book your seat!  
[elmerice.elmerfem.org/45-new-beginne...](http://elmerice.elmerfem.org/45-new-beginne...)

[Tweet to @ElmerIce1](#)



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## Welcome to the Elmer/Ice wiki

Elmer is an open-source, parallel, Finite Element code, mainly developed by the CSC-IT Center for Science Ltd. in Finland. Elmer/Ice builds on Elmer and includes developments related to glaciological problems. On this page you will find documentation and examples of the various solvers and user functions developed for **glaciological** applications using Elmer/Ice. Building Elmer/Ice on top of an existing Elmer installation is explained in the [Compilation Section](#).

The [Problems Section](#) presents the various categories of glaciological problems that can be solved using Elmer/Ice.

The [Solvers Section](#) and the [User Functions Section](#) describe the glaciology related solvers and user functions, respectively, that can be used to solve these problems.

Tools that can be used to mesh glacier and ice-sheet geometry are presented in the [Meshing Section](#).

The [Tips and Tricks Section](#) gives some useful demo of MATC, Post-treatments of results and more.

The [Courses Material Section](#) contains presentation as well as material proposed in the framework of the Elmer/Ice courses dispensed since 2008.

Some useful links are given in the [Links Section](#).

Scientific publications presenting glaciological applications with Elmer/Ice are listed in the [Elmer/Ice website](#).

start.txt · Last modified: 2012/12/03 17:45 by tzwinger

# Elmer/Ice mailing list

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To subscribe to the Elmer/Ice list *elmerice@elmerfem.org*, just sent an email to *majordomo@elmerfem.org*, with in the body the text:

subscribe elmerice

If you do not know how to use mailing lists run by majordomo you may sent a mail with "help" in the message body.

# Elmer/Ice Forum

Under

<http://www.elmerfem.org> :

- Go to **Elmer Forum**: find answers on all aspects of Elmer
- Click on **Elmer/Ice** link: find answers specific to Elmer/Ice
- To get access: **Register** in upper right corner

Elmer Discussion Forum • Index page - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Elmer Discussion Forum • Inde...

www.elmerfem.org/forum/index.php

Most Visited Linux Mint Elmer/Ice elmerfem.org

phpBB Elmer Discussion Forum Bulletin Board for Elmer FEM Users

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It's currently 02 Sep 2013, 10:54

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FORUMS	TOPICS	POSTS	LAST POST
<b>General</b> General discussion about Elmer	345	1289	by GastónGarcía 29 Aug 2013, 22:01
<b>Installation &amp; compilation</b> Discussion about building and installing Elmer	166	680	by Jyh-Shyong 30 Aug 2013, 18:02
<b>ElmerSolver</b> Numerical methods and mathematical models of Elmer	944	4108	by drueffer 30 Aug 2013, 16:54
<b>ElmerGUI</b> The graphical user interface of Elmer	228	908	by raback 26 Aug 2013, 00:05
<b>ElmerPost</b> Post processing utility for Elmer	90	346	by Edmund 30 Jul 2013, 11:01
<b>Elmer/Ice</b> Extension of Elmer in computational glaciology	8	27	by tzwinger 22 Aug 2013, 13:56
<b>External tools</b> Mesh generators, CAD programs, and other tools	113	558	by NickR7 30 Aug 2013, 18:04
<b>Software development</b> Discussion about coding and new developments	37	120	by Takala 22 Aug 2013, 09:02
<b>Bug reports</b> Clearly defined bug reports and their fixes	80	230	by millm 29 Aug 2013, 12:55
<b>Contributed Cases</b> Elmer cases by the users for the users	15	33	by sebastien ROUQUETTE 29 Apr 2013, 14:49
<b>HPC</b> High Performance Computing with Elmer	3	5	by madtom1999 21 Oct 2012, 15:34
<b>Commerical services</b> A forum for commercial service requests and offerings	3	3	by aether 12 Dec 2012, 11:33

ANNOUNCEMENTS	TOPICS	POSTS	LAST POST
<b>Updates</b> Updates in software, documentation, sites etc.	20	83	by mzenker 08 Jul 2013, 16:20
<b>Events</b> Courses, user meetings, seminars etc.	14	17	by raback 12 Apr 2013, 13:54

MISCELLANEOUS	TOPICS	POSTS	LAST POST
<b>Testing</b> Here you can test posting, attachments, ...	4	6	by Takala 03 Apr 2013, 10:16





**Elmer/Ice**  
@ElmerIce1

Open Source Finite Element Software for Ice Sheet, Glaciers and Ice Flow Modelling

[elmerice.elmerfem.org](http://elmerice.elmerfem.org)

TWEETS	ABONNEMENTS	ABONNÉS
24	19	69

Tweets   Tweets & réponses

 **Elmer/Ice** @ElmerIce1 · 26 août  
Two new Elmer/Ice courses this fall, for beginner and confirmed. Don't miss the date and register now! [elmerice.elmerfem.org/63-two-elmer-i...](http://elmerice.elmerfem.org/63-two-elmer-i...)

 **Elmer/Ice** @ElmerIce1 · 18 août  
Steep cold hanging glaciers located below 4000m are likely to become partially temperate by the end of this century [elmerice.elmerfem.org/62-thermal-cha...](http://elmerice.elmerfem.org/62-thermal-cha...)

# Important links (summary)

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Elmer at CSC (documentation, how to install, ...)

<http://www.elmerfem.org/>

<http://www.csc.fi/english/pages/elmer>

Elmer Forum

<http://elmerfem.org/forum/>

Elmer/Ice webpage

<http://elmerice.elmerfem.org/>

Elmer/Ice wiki

<http://elmerice.elmerfem.org/wiki/doku.php?id=start>

# How to share developments?

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Different groups are working on the development of new solvers or user functions (currently hydrology, calving, etc...)

When these developments have been published, solvers and/or user functions + examples + tests + documentation on the wiki should be made available for the community.

# Next advanced Elmer/Ice workshop

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- move to an Elmer/Ice Users Workshop
- don't present it as a course
- program mixing:
  - scientific/technical presentations of on-going works using Elmer/Ice by users
  - presentations of latest developments by developers
  - a time dedicated to support by developers in improving/starting users applications
  - a time to exchange on future developments and applications

Objective: get more users participating and a regular (every 2 years?) meeting for Elmer/Ice users