# Justification of resources: Shared frameworks for next-generation ice sheet modelling

## Investigator time

PI Rutt will be responsible for overall coordination of the project. As chair of the international Glimmer-CISM steering committee, he has been working closely with the Co-Is and project partners for several years. He will be responsible for the delivery of the website improvements and management of the graduate programmer delivering the Glimmer-CISM GUI (see Pathways to Impact Plan). Researcher Co-I Hagdorn will be responsible for delivering the structural and technical description of the modelling framework, and for implementing it in Glimmer-CISM, in collaboration with PPs Lipscomb, Price and Johnson. Co-I Hulton will be responsible for local management of Hagdorn. Co-I Payne will be responsible for commissioning training materials from Bristol-based graduate students. Each UK institution (Swansea, Edinburgh, Bristol) will be responsible for the organisation of one of the Framework development workshops, which will be led by the local PI (Rutt, Hulton or Payne). We have allocated PI/Co-I time accordingly: Rutt: 3.7 hours per week (10%); Hulton: 2.2 hours per week (6%); Payne: 2.2 hours per week (6%); Hagdorn: 18.5 hours per week (50%). We have chosen to allocate substantial time to Hagdorn rather than employ a PDRA because of the deep knowledge of both ice sheet modelling in general and Glimmer-CISM in particular which he brings to the project. We regard this as likely to be considerably more cost-effective than employing a PDRA without those skills. Hagdorn’s position at the University of Edinburgh allows up to 50% of his time to be dedicated to a project such as this.

## Framework development workshops

These workshops are central to the success of the project, and it is essential that they attract participants from across the international climate and ice sheet modelling communities. Accordingly, we have allocated significant resources to them, in particular to allow us to fund travel, accommodation and subsistence for workshop participants. We have costed for 24 participants in each workshop, which we judge to be a number which will allow as many interested parties as possible to attend, while keeping discussions manageable. The funding requested for participant travel (£500 per person, per workshop) is an average value, reflecting the fact that participants will travel different distances to attend. Accommodation and venue hire costs are estimated on the basis of purchasing an integrated conference package from the workshop venue. In addition, we have allowed for secretarial support for each workshop, which will ensure the organisation runs smoothly. Twenty days support per workshop is requested: secretarial support will include managing venue bookings, participant registration, catering, accommodation, and travel bookings for participants.

## Training events

The resource allocation for the training events is modest. In particular, the requested funds do not include travel or accommodation for participants, who will be expected to fund these themselves. Accordingly, the administrative requirements are lighter, and do not require dedicated secretarial support. We request funds to pay suitably-experienced, Bristol-based graduate students to write training materials and documentation on a per-hour basis. Funding is requested for two tutors to attend training events (accommodation, travel and subsistence): these will be drawn from the core project team (PI and Co-Is). Funding is likewise requested for venue hire.

## Travel

***UK Travel***. Close collaboration will be necessary between UK-based project members during the course of the project. Much of this will be done electronically – we already make full use of teleconferencing – face-to-face contact is essential as well. We request resources for 12 one-day meetings, each involving all four investigators (Rutt, Hulton, Hagdorn and Payne). These will take place approximately quarterly, and will be split between the three project sites.

***Conference Attendance.*** Community participation in the project and dissemination of outputs is a key activity. We of course expect to attract the most interested members of the climate and ice sheet modelling communities to the Framework Development Workshops, but wider dissemination within the Geosciences community will be essential. Therefore, we request resources for attendance of one investigator at four international conferences. These will be the AGU Fall Meeting and the EGU General Assembly. We expect to attend both conferences in the first and third years of the project.

## Other

We request a Linux workstation for Hagdorn to carry out code development and other project activities.

We request a sum for professional development of the project website: this is an essential public and community-facing portal for our impact activities.

We request page charges for two publications in peer-reviewed journals. These will contribute to the dissemination and profile of key project outputs. It is anticipated that a publication in *Geoscientific Model Development* (or similar journal) will comprise the definitive technical reference for the model framework, and is therefore of crucial importance.