WG14 N3873
Meeting notes

C Floating Point Study Group Teleconference

2026/03/18: 8:00 AM PDT/3:00 PM UTC
[Please submit proposed changes to these minutes to Jerome or to the group. Revision changes appear at the bottom.]

Attendees

Jim Thomas, Rajan Bhakta, Jerome Coonen, Damian McGuckin, Joshua Cranmer, Fred Tydeman, David Hough, Ariel Burton

Updated agenda plus new items

https://cfp-wiki.esi.com.au/pub/CFP/WebHome/CFP%20meeting%20agenda-20260318-update4.pdf?_t=1773865597 – These minutes should be read alongside the agenda, in this case a rare 4th update, with its many reference links.

Previous meeting notes

https://mailman.oakapple.net/pipermail/cfp-interest/2026-February/003807.html 2026/02/18 Meeting notes

Study group logistics

Next meeting: 15 April 2026, 8:00 AM PDT/3:00 PM UTC
ISO Zoom teleconference
Please notify the group if this time slot does not work.
David: Computer centers in Brazil rent time to bad players who attack system around the world, often for "protection" money. Penniless though it may be, our reflector has suffered collateral damage in the chaos.
Damian: Be aware that when you upload an updated file (with the same name) to the wiki, the upload may be slow after the Nth copy, for N seven to nine. This is due in part to the automated backup mechanism.

C documents

The latest C2Y draft is N3783 Jan. 2026 https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3783.pdf
C23 has been published ISO/IEC 9899, available for purchase. https://www.iso.org/standard/82075.html

IEEE 754 liaison

Damian: Trying nail Round-To-Odd and language. There's a new probabilistic rounding proposal. Propagation of NaNs is a continuing issue. At David Keaton's suggestion, Damian is proposing to be liaison between 754 and WG14/CFP.

C++ liaison

Joshua: Next meeting is the week of 23 March. Four papers are of interest:

1) http://wg21.link/p3938 -- clarifies the wording, like "infinity" and "NaN", needed to talk about the values floating point types might take.

2) http://wg21.link/p3899 -- clarify the behavior on floating point overflow.

3) http://wg21.link/p3935 -- update <cmath.h> to align with C23 <math.h>.

4) http://wg21.link/p3864 -- Use the prefix "cr_" to add correctly-rounded math functions to the library.

Joshua & Group: These functions use "to nearest with ties to even" rounding regardless of any prevailing rounding direction modes.

WG14 update

Rajan: Reviews detailed email summary (linked in the agenda). Most items pass with just 5 minutes of discussion apiece: preferred quantum exponent (N3703); clean up frexp, et al. (N3704); range bounds for math functions (with editorial changes) (N3731); floating expressions in translation time (N3732).

Rajan: In our proposals until now, we use a red strikethrough typeface for deletion and green for insertion. WG14 requests that we also underline insertions. The issue is red-green color blindness.

Group: Perhaps use blue for insertion. Will try blue underline in new proposals this month.

Rajan: The contentious issue, which took most of the CFP time in the meeting, was the proposal to refine the language of error reporting (3731). The proposal italicizes "occurs" to make precise the notion that what we generally view as a mathematical exceptional case "occurs as an error" in the C environment in just specific circumstances. WG14 said that defining that usage of "occur(s)" might affect other usage of the word in the standard. The motion passed, with the removal of the italics for "occurs".

Jerome: Takes action to revisit this proposal and this usage.

TS-4 and TS-5 revisions

Jim: Joseph Meyers has emailed about the error in TS-4 that CFP discovered. It acknowledges the issue and the proposed fix, though there is no planned action yet.

News

None

Carryover action items from last meeting

Group: Think about where CFP is headed.

Carry over

Action items from last meeting

Damian: Investigate the current state of default rounding(s) in 60559 and whatever is being discussed in the committee about changes, especially in decimal.

Closed -- there is the option to have the default rounding break ties away from 0.

Damian: Arrange to take the email archive from David. Discuss the status going forward.

Carry over

Damian: Document the wiki backup protocol.

Done

Jim & Jerome: Draft proposal re. double_t semantics and send a note to Joseph about the proposed solution.

Done

Jerome & Damian: Write a proposal to repair fromfp and enhance Table F.2.

Carry over

Jim & Damian: Look at the language around rounding direction in Damian's Annex F paper and make a proposal to CFP about how to go forward.

Done

Discussion of issues

Conflicting requirements for double_t

Rajan: Editorially, prefer to have underscore along with color for additions.

Group: Good to submit. Action.

Annex F special cases

Damian: Reviews many special cases, including some worked worked out with Fred. Will use square brackets for rationale items interleaved with proposal items.

Rajan & Group: In such a long proposal, burying the rationale at the end does not help the reader.

Jim: In frexp, "value" is the parameter, not "x".

Jim: modf is like frexp, not bound to a 60559 function, so could signal “inexact” or “underflow” unless specified to not signal any exceptions. The parameter "value" needs to be rationalized, too.

Damian: Amid the pages of editorial changes, there are just two technical changes: scalbn with a signaling NaN and the addition of a compoundn special case Fred noticed was missing.

Jim & Rajan: The changes are so small that we can just have one paper with both (2) technical changes and (many) editorial changes.

Jim: Suggests making the uniform syntax more explicit at the start of the proposal, giving the reader a better sense of the broad cleanup undertaken in the proposal.

Rajan: WG14 doesn't like long papers, but the items are small here so it may get through.

Jim: Encourages group to spend the time to review the next draft in detail. The challenge here is to get it all right -- and to convince WG14 that we have it all right.

Rounding direction language

Jim: Reviews his paper with Damian presenting terms to be used going forward.

Damian: Already in use in Annex F documents.

Jim: There is no proposal to update the whole standard with this language.

Group: Locution "standard/binary and decimal types" is a bit misleading.

Rajan & Group: Good clarification

Other issues

None

Adjournment

10:03 AM PDT

Action items to be carried over

Group: Think about where CFP is headed.

Jerome & Damian: Write a proposal to repair fromfp and enhance Table F.2.

New action items

Jim: Add agenda item to fix range bounds problem for complex fcns (as done for real functions in N3731).

'

Jerome: Research usage of "occur(s)" and how it applies to proposal n3737.

Jim: Submit doble_t proposal.

Damian: In the Annex F special cases paper, add the function header to the code examples (which will clarify the usage of the parameters).

Jim & Damian: Review the wording of F.10.4.7 and F.10.4.9 and propose any changes.

Damian: Update the Annex F Special Cases paper as technical plus editorial.

Damian & Jerome: Send a note to CFP about the usage of "current rounding direction".

Damian: Draft a proposal for a new table (F.3) in Annex F mapping the rounding direction attributes from 60559 to the language of C2Y.

Carryover discussion items

Fixes to symbols: minus signs and hyphens, etc.

Complex and signaling NaNs
INFINITY and _Float16

Function result vs return value
CFP future
Editorial issues F.2.2

Editorial issues F.3, etc.

Editorial issues F.10.1

Signoff

Respectfully submitted.

-Jerome Coonen