

# Fixing Geant4 Dataset Download Errors Manually

## Why?

Sometimes Geant4 throws an error during `make -j12` when it can't download required datasets. Here's how to fix it manually, because sometimes you just have to do things yourself.

## Steps

1. Download the datasets manually  
Get all required dataset files (`.tar.gz`) yourself and put them in a folder named `datasets` or `manual_fix`.
2. Extract but don't delete  
Extract all the `.tar.gz` files. **Do not** delete the original archives — you'll need them to match Geant4's hash checks.
3. Place extracted folders  
Copy all the extracted dataset folders to your build directory: `geant4-v[version]-build/data/`
4. Fix the externals  
Move one level up to `geant4-v[version]-build/` and enter the `externals` folder. Inside, each dataset has its own folder. Enter each one and then its `src` subfolder.
5. Replace the broken tarballs  
In each `src` folder, you'll find a `.tar.gz` file that failed to download properly. Replace it with your manually downloaded version. Make sure the filenames match exactly.

## That's it!

If you followed these steps, Geant4 should pass its hash checks, stop complaining, and build properly.

Happy simulating!