```
chan bodies[1:PR](int worker; point pos[*], vel[*]);
chan forces[1:PR](point force[*]);

process Worker[w = 1 to PR] {
  int blockSize = size of my block of bodies;
  int tempSize = maximum number of other bodies in messages;
  point p[1:blockSize], v[1:blockSize], f[1:blockSize];
  point tp[1:tempSize], tv[1:tempSize], tf[1:tempSize];
  double m[1:n];
  declarations of other local variables;
  initialize all local variables;
  for [time = start to finish by DT] {
    # send my bodies to lower numbered workers
    for [i = 1 to w-1]
      send bodies[i](w, p[*], v[*]);
    calculate f for my block of bodies;
    # receive bodies from and send forces back to
    # higher numbered workers
    for [i = w+1 to PR] {  # get bodies from others
      receive bodies[w](other, tp[*], tv[*]);
      calculate forces between my block and other block;
      send forces[other](tf[*]);
    }
    # get forces from lower numbered workers
    for [i = 1 to w-1] {
      receive forces[w](tf[*]);
      add forces in tf to those in f;
    }
    update p and v for my bodies;
    re-initialize f to zeros;
  }
}
```

Figure 11.13 Heartbeat program for the n-body problem.