Why these actions? What purpose for them?

1. *DDH diagnostics*
2. *Selective externalisation of Meso-NH microphysics*
3. *Physics-dynamics interfacing, accounting for host model's characteristics, scientific interoperability*
4. *Integration of 3MT innovative aspects within ARPEGE*

Some management theory

If you want to build a ship
don't herd people together to collect wood
and don't assign them tasks and work
but rather teach them to long for the
endless immensity of the sea

Antoine de Saint-Exupéry

So this management wisdom is a French invention

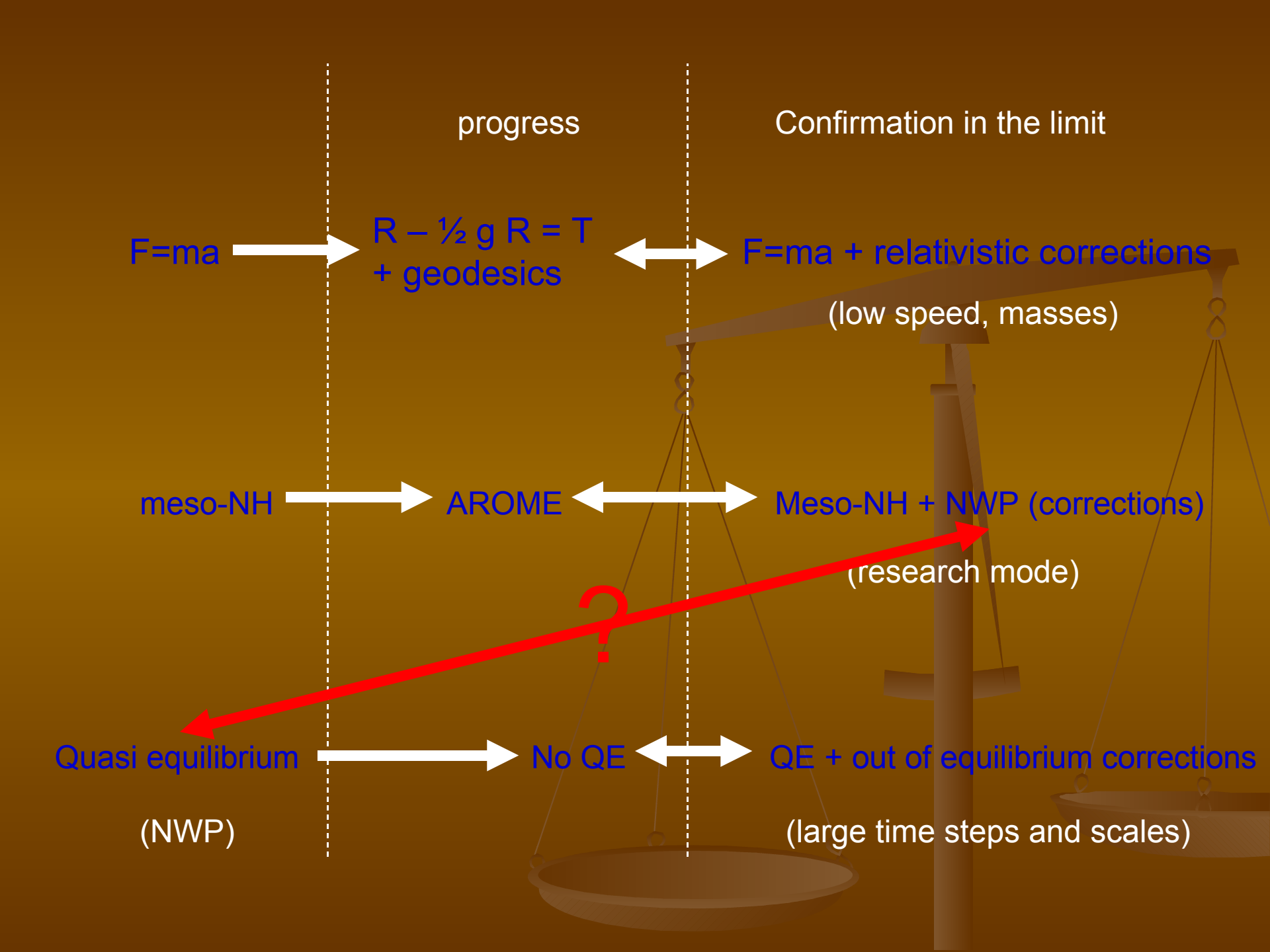
For models?

If you want to build a **model**
don't herd people together to collect …
and don't assign them … and …
but rather teach them to long for the
… immensity of …

Any scientist should fill in the dots for him/herself …

Collaboration benefit

- Investment decisions are based on an assessment of ***return vs. risk***
- ***Asymmetric information*** is deadly because one cannot correctly assess the risk and estimate the return. It leads either to wrong decisions or distrust.
- If you can not assess the risk it is better to choose an approach that is ***risk-free*** for YOU: at any stage reproduce the existing paradigm
- This is actually nothing else then good old fashioned science: F=ma -> R – ½ g R = T -> F=ma + relativistic corrections
- The first thing Einstein did was to check whether his equations contained Newton's in the limit of small masses and v/c ratio's.
- The relativistic corrections are useless if you want to put a satellite into an orbit.
- On the other hand, they have to be taken into account if you want to build an accelerator to search for the Higgs particle.
- In meteorology: meso-NH science -> AROME -> meso-NH + NWP ingredients
- But also: quasi equilibrium -> relaxed QE -> relaxed QE + corrections
- The ALARO concept: ensure that the established NWP paradigms can be reproduced in the "limits" where they are/were valid.
- Both approaches are considered ***risk-free*** but due to the ***asymmetry*** the notion of what actually is risk free differs.


progress
Confirmation in the limit
F=ma
R – ½ g R = T
+ geodesics
F=ma + relativistic corrections
(low speed, masses)
meso-NH
AROME
Meso-NH + NWP (corrections)
(research mode)
?
Quasi equilibrium
(NWP)
No QE
QE + out of equilibrium corrections
(large time steps and scales)

Interfaces

- This works! See SURFEX…
  - Status: implemented in ALADIN/ALARO but only runs with the good-old fashened ISBA scheme. Later TEB will follow (if it depends on Rafiq). So ISBA is the risk-free part. Later 2 stagiars will come to Brussels to work on this.
  - People outside MF (e.g. in Brussels) got involved and can started working with it (example: Hamdi and Masson, JAM, in press)
  - It opened the code and scientists can decide for themselves if it worth investing in it; so it allows non-MF scientists to realize their "longing for …"
  - This was possible by the **rules** (Best et al. 2004)!!!
- The same was foreseen for the Physics-Dynamics coupling in 2004. But started fading out within the Interoperability -> Transversality -> Convergence chain (What is next? "Osmosis"?). Imagine what we could have if we also would realize this.
- This is what is at stake behind these four actions!
- So, for us, the purpose of these actions is to somehow start getting rid of the asymmetry.

The immensity of Multiscale (how I would fill in the dots)

- Nature does not have a preferred scale
- Theories should preferably be scale independent. In physics there exist techniques for this: renormalization.
- Ergo … the formulation of Models should be preferably scale independent?
- Implement 3MT in ARPEGE and/or AROME. If it is good for the grey zone it HAS to be valid also for longer scales and (maybe) even for shorter scales …
- No end user of the model will ever care about this, but
- If convergence does not work we will probably miss a unique opportunity to get a glimpse of this immensity …
- This is also an example of the scientific method: deep convection should be present at any scale in the formulation but should gradually switch itself off when increasing the resolution, with the power to decide itself when this is appropriate

3MT

If you want to build a **model**
don't herd people together to collect *parameterisations*
and don't assign them ***M****icrophysics* and ***T****ransport*
but rather teach them to long for the
M*odular* immensity of the ***M****ultiscale*