The following is a list of “take home messages” from the workshop:

* Anomalies arise in global symmetries and local (“gauged”) symmetries. If they arise in gauged symmetries they must cancel for the theory to be consistent.
* In SU(2) the anomalous global symmetry concerns B+L. In SU(3) it concerns the U\_A(1) global symmetry related to chirality flips.
* Sphaleron transitions between topological different vacua are a resulting necessary ingredient of the Standard Model, albeit that theoretical calculations on transition rates have (very) large uncertainties.
* The size of the B+L sphaleron potential is about 9 TeV and that result is robust. The size of the SU3 sphaleron is related to the QCD scale.
* In the early universe sphaleron transitions are an ingredient in both Baryogenesis models and Leptogenesis models, albeit their net effect very different. In Baryogenesis they occur in a thermal regime where they **create** a B+L asymmetry (conserving B-L), in Leptogenesis they **wash out** a B+L asymmetry that was previously created via an "L-violation".
* The anomalous mass of the eta-prime can be an experimental indication of QCD instantons at work. In SU(2)xU(1) the anomaly in the global chiral SU(2) symmetry can be used to calculate the two-photon decay rate of the neutral pion to few percent accuray (as mentioned in Peskin and Schoeder's book on QFT, eq. (19.119)). The latter actually is only an evidence for anomalies, not for topological sectors.
* SU3 sphaleron transitions may cause a chiral magnetic effect in heavy ion collisions that could result in charge asymmetries with respect to the B-field direction resulting from non-central collisions. Alice is searching for such asymmetries.
* B+L sphalerons received a lot of attention two decades ago, but that died away perhaps partly related to the cancellation of SSC.
* Tye and Wong recently made a calculation claiming \*much\* higher transition rates, but their work is debated and uncertainties admittedly remain large. Their work, however, lead to renewed attention and various papers aimed at possible experimental searches.
* Several authors used the Tye and Wong result to test experimental sensitivities for sphalerons in pp collisions:
  + The signature is large final states (e.g. > 7 jets)
  + For LHC @ 14 TeV the rate would be about 100 times smaller than Higgs production
  + For FCC @ 100 TeV the rate would be 100 times larger than Higgs production.
  + The sensitivity of Pierre Auger/Icecube is roughly comparable to that of the LHC.