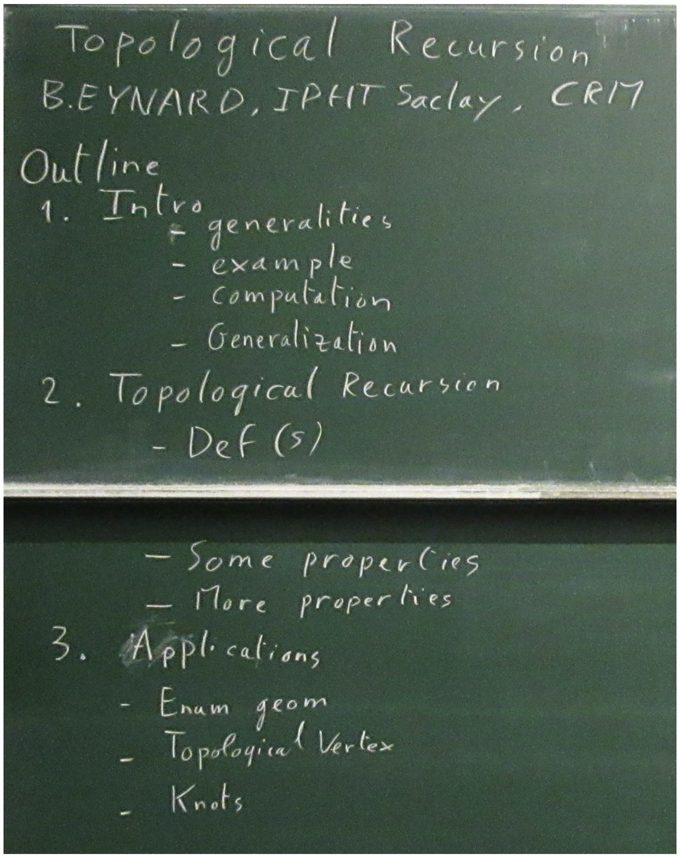
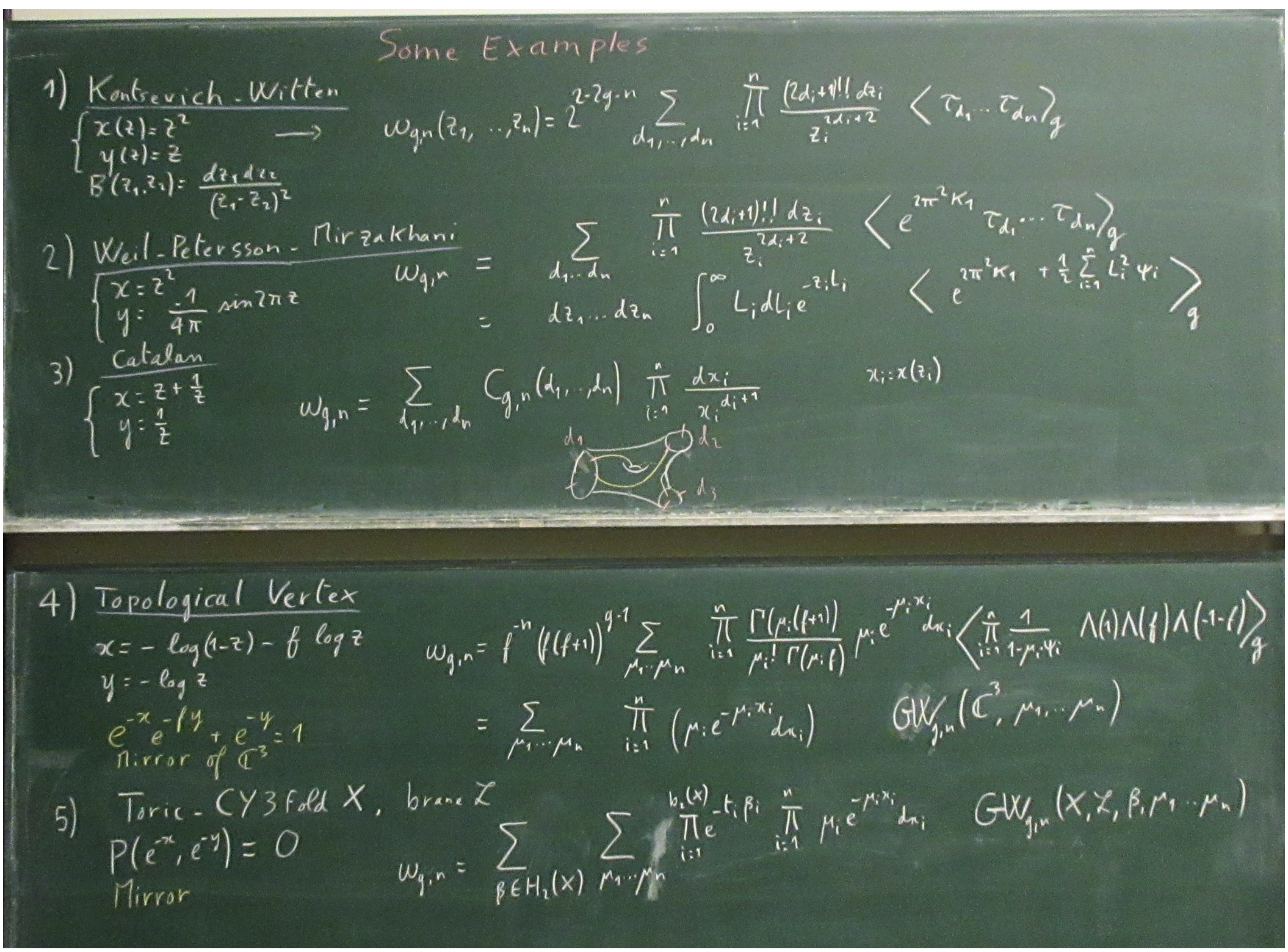
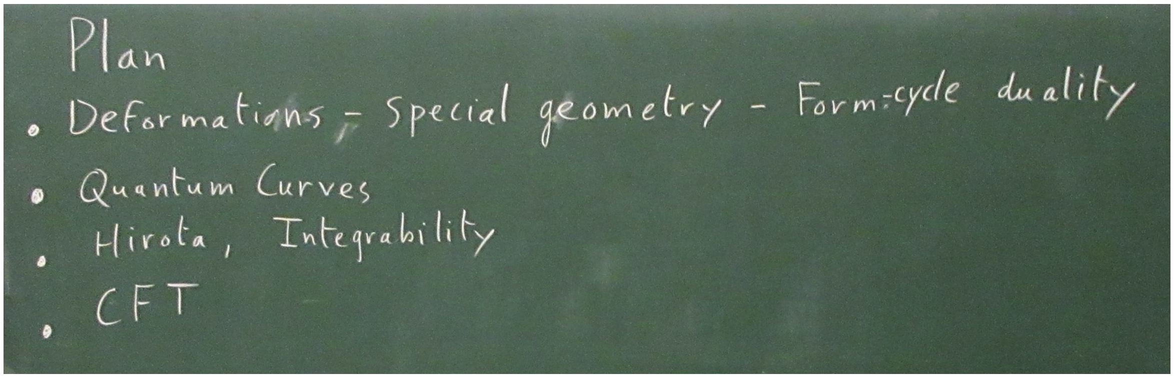
Lecture 1



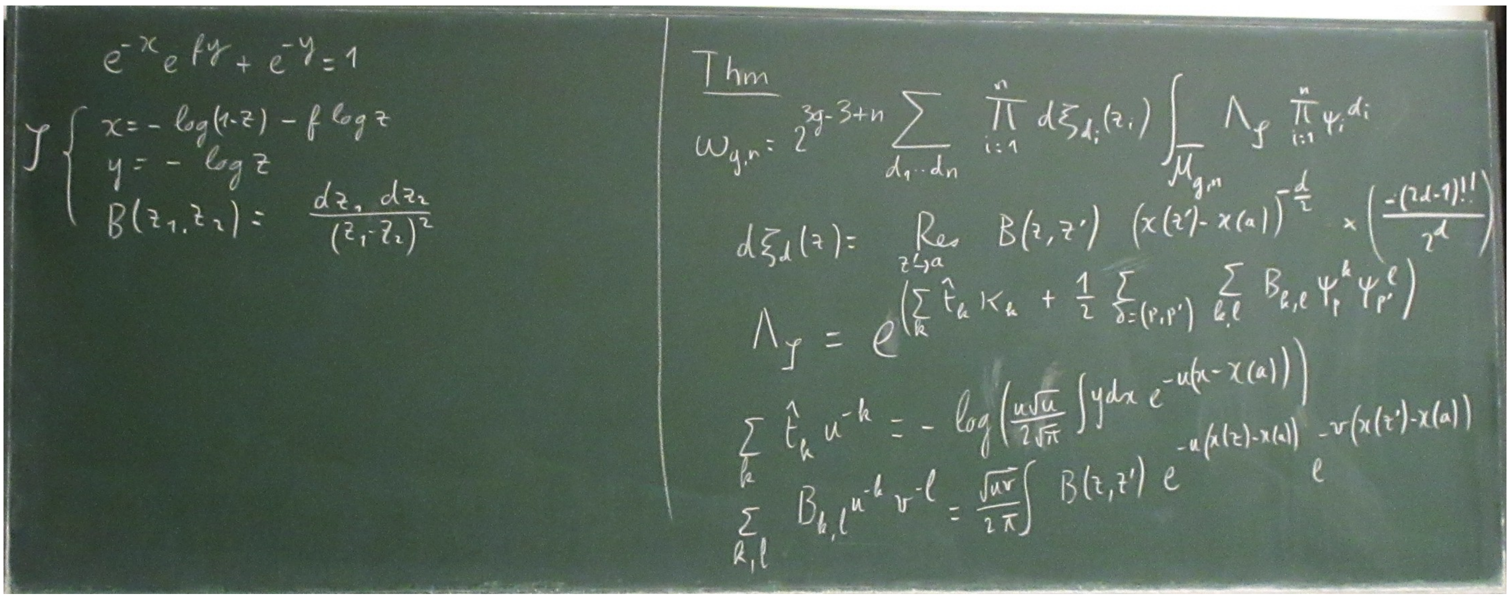
Lecture 2



Lecture 3



Plan
• Deformations - Special geometry - Form-cycle duality
• Quantum Curves
• Hirota, Integrability
• CFT



$e^{-x} e^{fy} + e^{-y} = 1$
$\mathcal{S} \begin{cases} x = -\log(1-z) - f \log z \\ y = -\log z \\ B(z_1, z_2) = \dfrac{dz_1\, dz_2}{(z_1-z_2)^2} \end{cases}$
Thm
$\omega_{g,n} = 2^{3g-3+n} \sum_{d_1 \cdots d_n} \prod_{i=1}^{n} d\xi_{d_i}(z_i) \int_{\overline{\mathcal{M}}_{g,n}} \Lambda_{\mathcal{S}} \prod_{i=1}^{n} \psi_i^{d_i}$
$d\xi_d(z) = \operatorname{Res}_{z' \to a} B(z,z') \left(x(z') - x(a)\right)^{-\frac{d}{2}} \times \left(\frac{-(2d-1)!!}{2^d}\right)$
$\Lambda_{\mathcal{S}} = e^{\left(\sum_k \hat{t}_k \kappa_k + \frac{1}{2} \sum_{\delta=(p,p')} \sum_{k,l} B_{k,l} \psi_p^k \psi_{p'}^l\right)}$
$\sum_k \hat{t}_k u^{-k} = -\log\left(\frac{u\sqrt{u}}{2\sqrt{\pi}} \int y\, dx\, e^{-u(x - x(a))}\right)$
$\sum_{k,l} B_{k,l} u^{-k} v^{-l} = \frac{\sqrt{uv}}{2\pi} \int B(z,z')\, e^{-u(x(z)-x(a))} e^{-v(x(z')-x(a))}$