References for
Initial Data for the Cauchy Problem in General Relativity

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100 years of General Relativity
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The following books are references for background in General Relativity

B1 Y. Choquet-Bruhat, *General relativity and the Einstein equations*, Oxford Mathematical Monographs. Oxford University Press (2009).

B2 S. W. Hawking and G. F. R. Ellis, *The Large Scale Structure of Space-Time*, Cambridge University Press (1973).

B3 C. Misner, K. Thorne and J.A. Wheeler, *Gravitation*, Freeman, Chicago, (1973).

B4 H. Ringström, *The Cauchy Problem in General Relativity*, ESI Lectures in Mathematics and Physics. European Mathematical Society (EMS), Zrich, (2009).

B4 R. Wald, *General Relativity,* Univ. Chicago Press, Chicago (1984).

There are a number of survey articles which provide excellent reference for aspects of these lectures. These are all freely available online

S1 R. Bartnik and J. Isenberg, *The constraint equations*, The Einstein equations and the large scale behavior of gravitational fields, 138, Birkhuser, Basel, (2004).
Available: http://arxiv.org/abs/gr-qc/0405092

S2 P.T. Chruściel, *lecture notes on the Cauchy problem*,
Available: http://homepage.univie.ac.at/piotr.chrusciel/teaching/Cauchy/Roscoff.pdf

S3 P.T. Chruściel, G. Galloway, and D. Pollack, *Mathematical general relativity: a sampler*, Bull. Amer. Math. Soc. (N.S.) **47** (2010), no. 4, 567–638.
Available:
http://www.ams.org/journals/bull/2010-47-04/S0273-0979-2010-01304-5/home.html
An extended version is available here:
http://arxiv.org/abs/1004.1016/

S4 J. Corvino and D. Pollack, *Scalar Curvature and the Einstein Constraint Equations*, Surveys in Geometric Analysis and Relativity, ALM 20 International Press (2011) 145-188.
Available: http://arxiv.org/abs/1102.5050/

S5 H. Friedrich and A. Rendall *The Cauchy problem for the Einstein equations*, Springer Lecture Notes Physics. 540 (2000) 127-224
Available: http://arxiv.org/abs/gr-qc/0002074

S6 G. Galloway, *Beijing Lecture Notes on Spacetime Geometry*, Beijing International Mathematics Reserach Center (2007).
Available: http://www.math.miami.edu/ galloway/beijing.pdf

The following research papers are the primary subject of Lectures 3 and 4, respectively

R1 Y. Choquet-Bruhat, J. Isenberg, and D. Pollack, *The constraint equations for the Einstein-scalar field system on compact manifolds*, Class. Quantum Grav. **24** (2007) 809–828.
Available: http://arxiv.org/abs/gr-qc/0610045

R2 M. Eichmair, G. Galloway, and D. Pollack, *Topological Censorship from the initial data point of view*, J. Differential Geometry **95** (2013), 389–405.
Available: http://arxiv.org/abs/1204.0278/