

ARTS1062

< c``mk ccX':]`a . '=bXi ghfmž'HYW.bc`c[mž'5Ygh\Yh]Wg</pre>

HYfa 'Hk c''##'&\$%-

7ci fgY'Cj Yfj]Yk

Ghuzz 7 cbhuWh8 Yhu]`g

'7cbj Ybcfg'

B Ua Y	9a U]`	5j U]`UV]`]lm	@cWUhjcb	D\cbY
FcXbYmK U``]g	f"k U``]g4 i bgk "YXi "Ui	6mUddc]bha Ybh cb`m		

GWkcc~7cbhJWh~abZcfa Uh]cb

Fcca " &ž Yj Y`" FcVYfhK YVghYf 6i]X]b[

D\cbY. f\$&L'-',) '(,) *

9a U]`. 'gUa 4 i bgk "YXi "Ui

K YVg]hY. \hdg.##gUa "Ufhg"i bgk "YXi "Ui

 $\label{eq:hamiltonian} $$HY'GWCC``cZhY'5ftg'UbX'AYX]U'kci`X``]_Y'tc'FYgdYWM\cong \cong m5W_bck`YX[Y'thY'HfUX]tjcbU``7i gtcX]Ubgž thY'6YXY[U'`fPYbg]b[tcb'WJadi gtž; UX][U'`fP]tmUbX'5fth' '8Yg][b'7Uadi gYgt'UbX'thY'B[i bbUkU' dYcd'Y'fbi gtfU']Ub'8YZYbW': cfW'5WJXYam']b'7UbVYffUt'cZthY'`UbXg'k\YfY'YUWX'WJadi g'cZl BGK ']g`cWJtYX''$

7ci fgY'8YW]`g

7 fYX]hDc]bhg *

Gi a a UfmcZh\Y 7ci fgY

GiVYWh5fYU.8[_ EfgV[We]

H\]g'Wci fgY'WUb'U`gc'VY'ghi X]YX']b'h\Y'Zc``ck]b['gdYW]U`]gUh]cb.'A YX]Už'7i `hi fY'UbX'HYW\bc`c[m

7 ci fgY @YUfb]b[Ci hWca Yg

- %" ⇒XYbhjZm_YmZYUhi fYgʻcZWcbhYa dcfUfmiUbX`WUgg]WU``<c``mk ccX`WjbYa U`UbX`Wcbj YbhjcbgʻcZ WUgg]WU``<c``mk ccX`bUffUhji Y
- &" ⇒ YbhjZmigca Y`cZh\Y`hYW\bc`c[]WJ`ž'dc`]hjWJ`ž'gcWjU``UbX`YWcbca]WZJWhcfg`h\Uh\Uj Y`g\UdYX`h\Y\]ghcfmicZ<c``mk ccX`WjbYa U
- ' "DYfZcfa 'VUg]Wg_]``g']b'UbU`mg]b['UbX'dUfUd\fUg]b['gWkc`Uf`mlYI hg']b'Z[`a 'gh X]Yg"

HYUWX]b['GhfUhY[]Yg'

:]a gWfYYb]b[g'dfcj]XY'h\Y'ZcW g'cZh\Y'Wci fgY'UbX'k]``Hu_Y'd`UWY'YUW\k YY_'UZhYf'h\Y`YWh fY":]a g'\Uj Y'VYYb'gY`YWfX`]b'cfXYf'hc'XYa cbghfUhY'\ck '<c``mk ccX'W]bYa U'\Ug'XYj Y`cdYX'h\fci [\ci h'h\Y'\\\dots']b'fcXi WY'ghi XYbhg'hc'k cf_g'h\Uh'VYghYl Ya d`]ZmXYj Y`cda YbhU`'hfYbXgž'h\Uh'ghfUXX`Y'U'fUb[Y'cZ[YbfYgž'UbX'h\Uh'U``ck 'ghi XYbhg'hc'cVgYfj Y'UbX'fYZYWhi dcb'W\Ub[Yg']b'h\Y'\\cc``mk ccX'ghm`Y"

@YWi fYg`UfY`XYg][bYX`lc`dfcj]XY`U`WcblYI hZcf`Z]`a `gWfYYb]b[g`Vm[]j]b[`Ub`\]glcf]\W``cj Yfj]Yk `cZh\Y` <c``mk ccX`gmghYa žci h]b]b[`lh\Y`X]ZZYfYbhgi VgmghYa g`h\Uhigi ddcfhih\Y`<c``mk ccX`gmghYa ž'UbX`dUm]b[`dUff]\W``Uf`UhYbhjcb'lc`h\Y`]a dU\WicZ_YmY\Wcbca]\W``^f]X]\W'`žgc\\U`ž\]glcf]\W\``UbX`h\Y`\bUhi fY`cZh\Y`]bXi ghfm''H\YmU`gc`dfcj]XY`YI d`UbUh]cbg`cZfY`Yj Ubh\\Cb\\dhg`UbX`XfUk `ghi XYbhg'`UhYbhjcb'hc`dUff]\W``Uf]h]Yg`cZZ]`a `ghm`Y"

Tutorials will delve deeply into issues and ideas raised by the readings and their relation to the weekly screenings and will be focused on student-led discussion, thus ensuring that students develop the capacity to think independently about the course material.

5ggYgga Ybh

5ggYgga YbhHUg_g

5ggYgga Ybh'hJg_	K Y][\h	8iY'8UhY	Gh XYbh@YUfb]b[CihWcaYg5ggYggYX
K f]h]b['HUg_'	&\$I	K YY_''	
F YgYUfVX "HUg_"	(\$1	% #\$+#&\$% `%%\$\$`DA	
9ggUmi	(\$1	%\$#\$, #&\$% `%%\$\$`DA	

5ggYgga Ybh8YhJ]`g

5ggYgga Ybh'% K f]h]b['HUg_

GhUfhXUhY. Bch5dd`]WUV`Y

 $8YHJ]\hat{g}.Ge \qquad \qquad f \quad q \qquad \qquad gY\hat{u} \qquad hT \qquad \qquad gYT \qquad T \quad b)$

5 hm/b X Ub VW F Yei] fYa Ybhg

 $\hbox{Ghi XYbhg'UfY'ghfcb[`mYbWci fU[YX'hc'UhhYbX'U```WUggYg'UbX'fYj]Yk ``YWhi fY'fYWcfX]b[g''] } \\$

7ci fgY'GWXYXi `Y

J]Yk 'WUgg'hja YhUV'Y

H]a YHJV`Y

8UhY	Hmd Y	7 cbhYbh]
K YY_^%	Hi hcf]U`	±btfcXiWf)cb hc h\Y WtifgY	1
	@YWhifY	9Ufimi <c``mk.ccx' 'h\y'dfcxi="" td="" wfjcb'7cxy<=""><td></td></c``mk.ccx'>	
K YY_"&."%\$">i bY"!"%(Hi hcf]U`	9Ufm <c``mkccx' 'h\y'dfcxi="" td="" wjcb'7cxy<=""><td></td></c``mkccx'>	
>i bY	@YWhifY	H\Y`Ghi X]c`GmghYa :/ `7`Ugg]\W\`` <c``mk ccx`ghm\y<="" td=""><td></td></c``mk>	
K YY_'' .'%+'>i bY'!'&%	Hi hcf]U`	H\Y`Ghi X]c`GmghYa :/ `7`Ugg]\W\`` <c``mk ccx`ghm\y<="" td=""><td></td></c``mk>	
>i bY	@YWnifY	<c``mk \$g'!'h\y'5[y'cz±j ybh]cb<="" ccx']b'h\y')="" td=""><td></td></c``mk>	
K YY_'(.'&('>i bY'!'&,	Hi hcf]U`	< c``mk ccX']b'h\Y') \$g'!'H\Y'5[Y'cZ±jjYbh]cb	
>i bY	@YWh fY	<1.57 / 'h\Y' < c``mk ccX'6`UW_`]gh	
K YY_`). '%'>i `m'! ') '>i `m	8. bY YY K	YY'G TGm 8. b'-	8. bcT
			-

Fygci fWyg

DfYgWf]VYX F Ygci fWYg

 $F \ Ygci \ fWYg'k \] ```VY'a \ UXY'Uj \ U] `UV`Y'j \] U'A \ ccX`Y \\$

FYWca a YbXYX FYgci fWYg

FYgci fWg'k]``'VY'a UXY'Uj U]`UV'Y'j]U'A ccX'Y

Gi Va]gg]cb cZ5ggYgga YbhHUg_g Gi Va]gg]cb cZ5ggYgga YbhHUg_g Hi fb]h]b Gi Va]gg]cb

5 WUXYa]W<cbYghmUbX D`U[]Uf]ga

D`U[]Uf]ga `]g`i g]b['h\Y`k cfXg`cf`]XYUg`cZch\Yfg`UbX`dfYgYbh]b['h\Ya `Ug`mci f`ck b"'\lefi\Wb'hU_Y`a Ubm Zcfa gžZfca `XY`]VYfUhY`W\YUh]b['hc`UVW]XYbhU`mWcdm]b['Zfca `U`gci f\W' k]h\ci hUW_bck `YX[Ya Ybh'

IBGK [fcidgdu[]uf]ga]bhch\YZc``ck]b[WuhY[cf]Yg.

7 cdm]b[.'i g]b['h\Y'gUa Y'cf'j Yfmg]a]`Uf'k cfXg'hc'h\Y'cf][]bU`hYl h'cf']XYU'k]h\ci h'UW_bck `YX[]b['h\Y gci fW'cf'i g]b['ei chUh]cb'a Uf_g"'H\]g'U`gc'Udd`]Yg'hc']a U[Ygž'Ufh'UbX'XYg][b'dfcYWhgž'Ug'k Y``'Ug dfYgYbhUh]cbg'k \YfY'gca YcbY'dfYgYbhg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h'WfYX]h'

=\uddfcdf]UhY 'dUfUd\fUg]b[.'7\Ub[]b['U'ZYk 'k cfXg'UbX'd\fUgYg'k \]'Y'a cghmfYhJ]b]b['h\Y'cf][]bU`
ghfi Whi fY 'UbX#cf'dfc[fYgg]cb'cZ]XYUg'cZh\Y'cf][]bU`ž'UbX']bZcfa Uh]cb'k]h\ci h'U\u\bck `YX[Ya Ybh''h\]g'U`gc
Udd`]Yg']b'dfYgYbhUh]cbg'k \YfY gca YcbY'dUfUd\fUgYg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h'WfYX]h'UbX'hc
d]YW]b['hc[Yh\Yf'ei ch'g'UbX'dUfUd\fUgYg']bhc'U'bYk 'k \c'Yž'k]h\ci h'Uddfcdf]UhY'fYZYfYbW]b["

- i bXYfgfUbX mci f'f][\hg'UbX'fYgdcbg]V]`]hJYg'Ug'U'gh XYbhUhl BGK
- VY`Uk UfY`cZd`U[]Uf]ga ž`Wcdmf][\hz'l BGK `Gh XYbh7cXY`cZ7cbXi WhUbX`5VWWdhUV`Y`l gY`cZ I BGK `=\forall H`F Ygci f\W\g`Dc`]\m\m
- VY 'Uk UfY 'cZh\Y 'ghUbXUfXg 'cZVY\Uj]ci f'Yl dYWYX 'cZYj YfmcbY ']b 'h\Y 'l BGK 'Wca a i b]hm
- `cWUHY 'gYfj]WYg'UbX `]bZcfa UH]cb'UVci hI BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZh\YgY'UfYUg'k]``VY'ZJa]`]Uf'hc'mci ž'ch\Yfg'k]``VY'bYk"'; U]b]b['U'gc`]X'i bXYfgHJbX]b['cZU``h\YfY`UhYX'UgdYWng'cZ9@+69'k]``\Y`d'mci 'a U_Y'h\Y'a cghicZmci f'ghi X]Yg'UhI BGK "'\\hd.##qi VYWfi |XYg"`]VfUfm'i bqk "YXi "Ui #\`]qY#JVci hY`]qY

5 WUXYa]W = b Zcfa Uh cb ·

: cf`YggYbhJU``gh XYbh`]bZcfa UhJcb`fY`UhJb['hc.

- fYei Yghg Zcf Yl hYbg]cb/
- `UhY`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk 'cZa Uf_g/
- I BGK '< YU`h\ 'UbX'GUZYhm'dc`]W[Yg/
- YI Ua]bUhcb dfcWXi fYg/
- gdYWJU``Wcbg]XYfUhJcb`]b`h\Y`Yj YbhcZ]``bYgg`cf`a]gUXj Ybh fY/
- gh XYbhYei]mUbX X]gUV]`]m/
- UbX'ch\Yf'YggYbhJU`'UWUXYa]W]bZcfa UhJcbž'gYY

\hdg.#k k k "Uffg"i bgk "YXi "Ui #W ffYbhgh XYbhg#UWJXYa]W]bZcfa Uf]cb#dfchcWc`g![i]XY`]bYg#

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$= a U[Y^T 7 fYX]h$

5 i gh|b *&\$% 'G\]`]b['K i

7F = 7CG

7F = 7CG Dfcj]XYf 7cXY. \$\$\$-,;