FOR LECTURE ON SCI-REL:COSMOLOGY

I Q "Rel Truth vs Sci Truth" = long histry Westn wrld, esp Chty. Careers made/broken, lives enhancd/lost, in bitter polemics...Galileo/Coprncus.

Too oftn b both guilty ovrsttmnt. REL...SCI... Intrstg: Adin Steinslz: ~25 yrs ago poll Amer univ profs/ Q: Blv in Gd? If nt-why nt? A. Most profs Sci-blv. Humanties-No. Reason: bec Sci has provn rel claims=false... _____

Prob Sci/Rel=quite complictd.BUT, while Jsm=mch sturm/ drang no bloodshed:each, Jsm/ nat sci, spoke in name Truth.

There 's mch t say re: Sci/Rel—but not now. Briefly, my view:seprt Truths...Bbl not text hw create wrld 6 days -----

My major intrst ths evnng=cosmlgy. One of 1st problems cosmlgy=lf othr worlds

2500 years ago, Anaximander: infinite numbr worlds, some in process of being born/dying. 200 yrs later, Democritus: same re: infnty time/space.

Such speculation rife thru ages.3-400 yrs BEFORE man on moon, scholars discussd: intllgnt beings elsewhere in some other solar system. -Kubrick...see F&D....(רמב"ם ורס"ג) Now: EXOBIOLOGY--On attd Jsm - I got invlvd

II. Whn I undergrad, most athsts/agnostcs: Arsttln Etrnty Mttr; Creatn="myth". Then: BIG BANG! ... And 45 yrs ago, dscvrd defntv evdnce expnns unvrs fr hot/promrdial State. Sinc thn: expnsn+coolg unvrs= unifyg theme cosmlgy. Just as Drwin'n evol=unifyg theme bio. W-o evoln+expnsn, mod bio+cosmgy- make little sense...

BUT 1991 Sci mgzn: Bg Bng mght hv t b junkd! Headln: "BG BNG BLOWN To BITS". But: Apr '92-Geo Smoot (UofC) detected faint irregulrties in bath micrwavs

Now: B-B .. 13.7 Blln yrs agoark energy was a complete surprise. Figalaxies is 20 percent, and faster apart, is 76 percent, they now say, ordinary atomic matter is 4 percent of the cosmos; dark matter to the cosmos of the cosm

You might wonder just exactly what kind of triumph "precision and dark energy, percent of the universe is unknown dark stuff.



After all, 96% of univrs=still waitg t b found

III. We now come to the truly outlandish: the asexual reproductn of universes

Physcst Lee SMOLIN—(West Side boy prnts-Brnx):"black holes + bubble unvrse hold key t Lf". Probg wht happnd frst momnts of Time or: wht happns at enter of Black Hole

F him: laws of physcs not fixd/invariabl. JHer: B-B happnd in Black Hole—in a prior univrs Our own univrs new copies of slf in recesses black holes scatterd across sky. Then the baby unvrses expand & reproduce

So wht hv we here?—unvrss beget unvrss whow diffrt laws Ntr I think what our unvrs needs=a csmlgcl contraception!... I no sctst, but lrnd bit Talmd—א בויך סברא. No O-U of sci: עדות שא"א יכול להזימה=not falsifiable...

IV. Now t more of samep-but even mr radical. ("Big Brain Theory: Have Csmolgists Lost Theirs?" They: our memories/world you think y see around you=illusions!

In words Sean Carroll (Cal Inst Techlgy): "WE KNOW MUCH BUT WE UNDRSTAND LITTLE" What commedbl Modesty!

> In the end, what does our exploration really mean? One quote has resonated with many scholars, who have attributed it to various authors, including Arthur C. Clarke and Isaac Asimov: "There are two possibilities. Maybe we're alone. Maybe we're not. Both are equally frightening." It would be trilly mind-hongling to deter

could be an advanced version of a guy wumans don't realize that their lives who spends his weekends building moc and their world are just illusions creatworlds like the Sims.

But now it seems quite possible. In fact, if you accept a pretty reasonable assumption of Dr. Bostrom's, it is almost a mathematical certainty that we network of computer circuits. are living in someone else's computer simulation.

el railroads or overseeing video-game ed in their brains while their bodies are suspended in vats of liquid. But in Dr. Bostrom's notion of reality, you wouldn't even have a body made of flesh. Your brain would exist only as a

There could be layer upon layer or since lations until you finally reached the architect of the first simulation - the Prime Designer, let's call him or her (or PRAISE BY STATE Design-

V. Wee now come t somthing even mr weird, even scary Philosphr at Oxford, Nick BOSTROM. We are all living in a virtual, not a "REAL" world.

Writer: It nvr occurred t me tht the omniscient omnipotent Creator Hvn/Earth

Dr. Bostrom assumes that technologi-our world. Whatever you're tour cal advances could produce a computer now — a sheet of paper, a keyboard, a with more processing power than all the coffee mug—is real to you even if it's brains in the world, and that advanced created on a computer circuit rather "ancestor simulations" of their evolutionary history by creating virtual worlds inhabited by virtual people with fully developed virtual nervous sys-

than fashioned out of wood, plastic or

You still have the desire to live as long as you can in this virtual world — and in any simulated afterlife that the designer of this world might bestow on you. May-

There would be no way for any of these ancestors to know for sure whether they were virtual or real, because the sights and feelings they'd experience would be indistinguishable. Receipe

 ${
m VI.}$ Finally, a down-to earth note of sanity. And some Humor.

By Peter Berkowitz Vantagastic alifte

hysicist Alan Sokal's article in the journal Social Text, submitted as a hoax and unwittingly published, has left its editors huffing with indignation. But beyond the bruised academic egos the episode raises an extraordinary question: What does it say about the state of academic life that leading scholars were unable to distinguish serious argument from útter nonsense?

It was in the pages of the May/June issue of Lingua Franca that Professor Sokal explained that his essay, "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity," was exactly as it appeared: a random assortment of arcane, jargoninfested abstractions. Filled with trendy pronouncements about the need to establish an "emancipatory mathematics," and a "liberatory science," it was, by its author's own account, devoid of both evidence and reasoned argument.

In the scandal's wake Social Tert's editors are a strict are sell- introducery INTIM IN gras sciences,



VII. Conclusion: I confess I less than honest w you
True, many of the avant-garde scnts may be way out but their intuition is not crazy!
Fact: Many of their theories etc have precedent in sober J trad
THUS: plurality of words: מוריב: ב"ר: הקב"ה בונה עולמות ומחריבן:
OR: Worlds giving birth t worlds: א"ס וספירות and each=a world
SO: Creation & Emanation (latter=Pythagoreans: each level=lesser). Tor xt=creatn; Zohar—emanations
AND: Quaternity of Worlds—אבי"ע .evn tho they=□ystical.....
AND: Our existence=virtual.not real: ACOSMSM! אר"ח ובעה"ת ובעה"ת

I suggest we borrow, fr book *TuM*, a theory contmprary atomic physics, esp Niels Bohr's theory complementarity. Bohr noted puzzling situations in effrt t comprehend univrs where various approachs t reality appear mutually exclusive and yet each legit. He:findings of nuclr physics=complementry: they cannot be describd w-o expressions tht=logiclly irreconclbl. Ex: paradxcl natr of atom which, acc t sm exprimnts=undulatory... other = discrete particles, quanta. So: nature of light. Each set of results=opposite to other, yet reality ~oppost proprts that complement each othr; complementry t each othr, 2 apparently contradictory aspects are necessary to grant us a full understanding of atomic reality.

Bohr: multiple approach t tr~not only f subatomc physics/science, but f all areas hum cognitn/creatvty. Thus, sci/art, compassn/justice, neurophysiolgy/psych, action/thought—many other such pairs=complementry. Student, Victor S. Weisskopf, adds t sci/art: "We can't at same tm experinc artstc contnt Beethvn sonata & also worry about neurophysiological processes in our brain. But we can shift from one to the other....One view complements the other, and, we must use all of them in order to get a full experience of life."

This not easy idea to accept. We tend quite naturally to favor clear-cut, precise, and universally valid answers that exclude all alternative approaches. But atome physics teachs us is t liberate selvs fr prejudice the reality necessarily conform t contours/biases of our limitd minds. There are, it holds, 2 kinds of tr: superficial r, opposite of which= falsehoods, & deep trs, opposite of which=also true. Each conflicting proposition may b true, reflectg an aspect of an ultim tr about reality too large/complex t b containd in simple logic t which we accustomed.

So w regard to duality Re/Sci vision Tr. Thy=complemntry t each othr. Each by self=not adeqt t descrb our 2-fold commitment. Bt togther convey completely beauty/power of dual vision. When standing in pray/studyg אט גמרא beauty/power of dual vision. When standing in pray/studyg אט איל doing mitzvah—we indulge our rel dimension; sci=not on our radar screen at sch tms. So, when work in lab/office/univty classroom, we do so acc t immannt discplins in which we engaged—at sch tms we concentry on provbl/probabl/profitable.

Bt אל משכבנו בלילות, whn we contemplte w perspetiv our roles/succsses/failurs as full hum beings, as unfragmentd childrn of Abr/Isc/Jac – thn we know both= true, each in one way, & insistenc on complementrity is whit prevnts us fr falling prey t spl dissonne /emotionl schizophrna. Thn we confidntly assert hale dualism w whole heart, בְּלֵב שְׁלֵם

יבריינ א-כח: אַתָּה שְׁל בּיבר מענה אַל בְברוֹת דּוֹרֵשׁ הִי בֹי בּיביו אַ מְבִּיבוֹת דּוֹרֵשׁ הִי בֹּי בּיבי אַ אַרְבּיֹת דּוֹרֵשׁ הִי בֹּי בִּיבּי אַן פּיבר בּי בּיבּי אַר בּיברית דּוֹרֵשׁ הִי בּיביו אַר בּיברים אַרְבּיִּר בּינבר בּיברים בּיבר בּיברים בּיברים

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<u>Post-lecture comments on Cosmology-religion</u> (The original lecture was given at the Columbia Program in Science and Religion held on April 15 at Congregation Ramat Orah)

- 1) The lecture was comparatively short; it should be expanded somewhat.
- 2) There was too much reading from the extract I used. Instead, pass it all into my language and organize it better.
- 3) The idea is: first, present what the contemporary cosmologists are saying and then criticize them for extravagance, no falsifiability, and extravagance: how can one posit other universes with other natural laws and still be able to communicate with them? If not, all this talk is just so much intellectual chatter.
- 4) The spoof by Man Sokal. Reorganize it so that I put the quote first and then say that it was a spoof by Sokal and then the conclusion that sometimes the best scientists are beguiled by currents that are beyond them (especially the post-modern lingo of the humanities).
- 5) At the end, when I show that despite all my criticisms and snide remarks, the fundamental ideas were already known and written about some two-thousand years ago in the Midrash. In addition, Kabbalah, RHV and the Baal Hatanya, and the use of these concepts in reciting the Shema (as in my book of the same name).